JUNE 1961

FOOD ENGINEERING

A CHILTON PUBLICATION

FOR BETTER MANAGEMENT IN MANUFACTURING

CONTAINERIZATION

FE SPECIAL REPORT

ALSO: Accelerated Freeze-Drying p.33 FTC Readies Big Stick p.37

Research-oriented, quality-conscious and profit-minded, Quality Carriers, Inc., Burlington, Wis., considers Macks an all-important part of both its liquid-foodstuff hauling fleet (shown here) and its petroleum and chemical transporting affiliate, Bulk Transport. Quality just recently opened its new Chicago terminal . . . and has inaugurated a new method of handling dry bulk commodities in pressure vessels unloaded by air.

Burlington, Wisconsin, carrier stresses

QUALITY in name..service..and equipment

In 1939 Lee Barney and Pat Torhorst were a couple of aggressive young men with a one-truck garage, lots of ambition and a dedication to give their customers the best job they knew how. Today, as QUALITY CARRIERS, INC., over 200 stainless steel tank trucks bearing the Quality name operate from a network of terminals to every corner of the U.S. east of the Rockies.

Lee Barney and Pat Torhorst have built Quality Carriers, Inc., into one of the finest liquid and dry bulk operations in the country. They did it through use of modern methods and equipment . . . and an insistence on living up to the name QUALITY in every phase of their far-flung operation.

Herman Pearce, Vice President and General Traffic Manager, puts it this way. "You don't try to cut corners on quality when your operation depends on the performance of your equipment. We've got 105 Mack Thermodyne® diesel tractors in our fleet, and we're adding more all the time. If a better truck ever comes along we'll buy it—but as of now, Macks are doing the job the way we want it done."

Take a leaf from the book of a successful carrier like Quality and put Macks to work hauling your perishable cargoes. For dependability and unmatched economy you can't surpass a Mack. The Mack branch or distributor nearest you will be glad to show you performance records of others who have found a profitable difference in Macks. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario. 8017

MACK
FIRST NAME FOR
TRUCKS

MACK for over 6 straight years NO. 1 by far in sales of diesel trucks

CIRCLE 2 ON INQUIRY CARD

FOOD
ENGINEERING
FOR BETTER MANAGEMENT IN MANUFACTURING

VOL. 33 NO. 6

June, 1961

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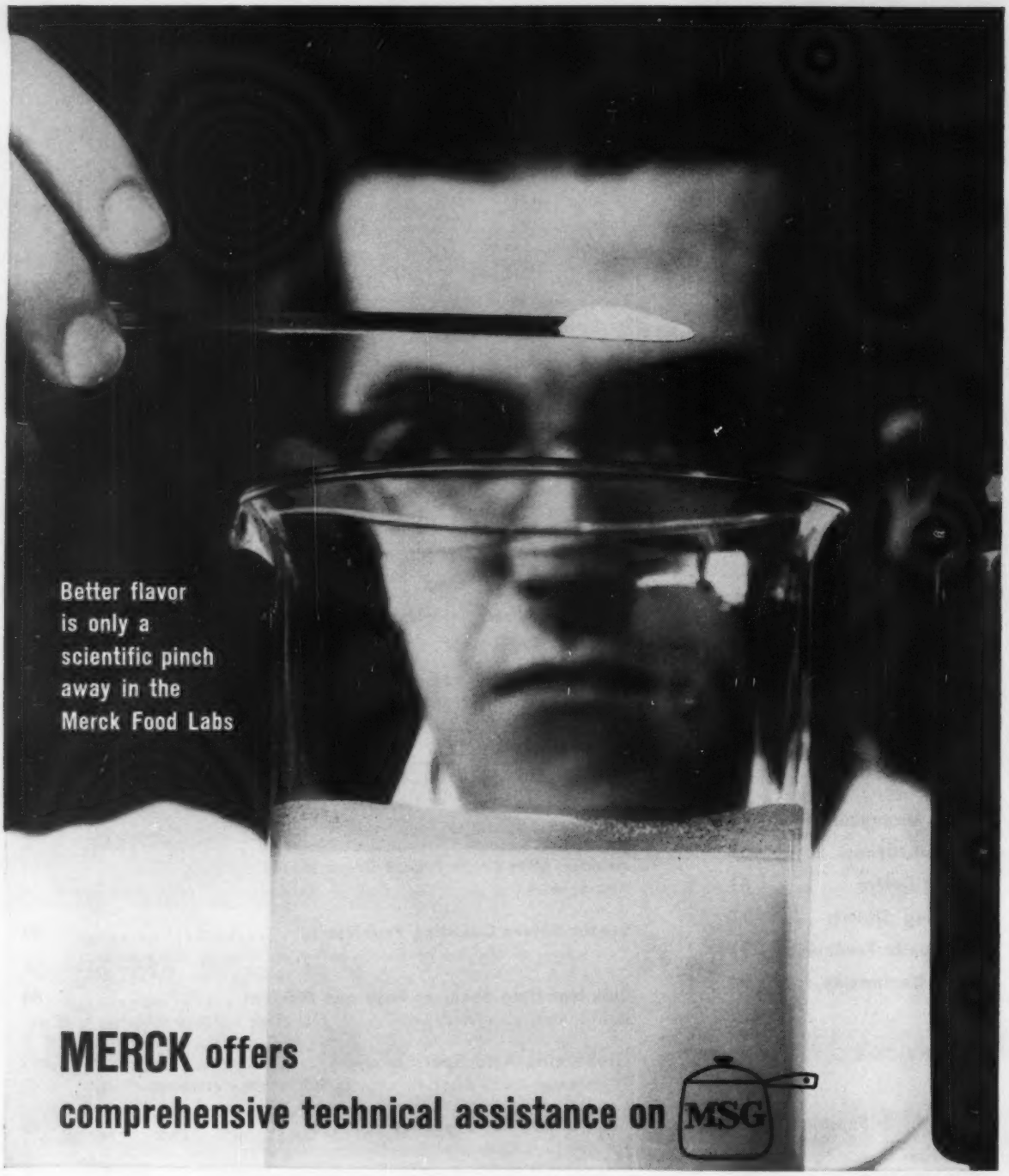
Paul Rand Dixon

EXCLUSIVE

FE Quizzes FTC Head

A record number of food companies were hauled before the FTC last year. Here's a timely behind-the-scenes analysis of this regulatory agency's future course.—p. 37.



MERCK offers comprehensive technical assistance on MSG

It doesn't always take a major change in formulation to effect an improvement in a food product's flavor. Sometimes it can be done with the equivalent of a pinch of MSG . . . or a slight modification in formula to get the most out of the MSG that is already in the product. It's all a matter of experience with MSG and a desire to work hard for the right answer.

You'll find specialists in the Merck Food Laboratories strong on both counts. This creative group offers a broad range of technical services relating to the use of MSG, from evaluating your new product formulations to improving flavor of your existing products.

Just as a reminder, Merck is in a better position than ever before to satisfy your appetite for MSG. A $2 million plant expansion has increased production capacity for Merck MSG by 100%. For details on delivery of MSG or technical assistance on its use, simply call your Merck representative.

MERCK CHEMICAL DIVISION
MERCK & CO., INC. • RAHWAY, NEW JERSEY

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Chestnut & 56th Sts.
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FOOD ENGINEERING (Formerly Food Industries) June, 1961, Vol. 33, No. 6.

Published monthly by Chilton Company: Executive, Editorial, Circulation and Advertising Offices, Chestnut & 56th Sts., Phila. 39, Pa. Second class postage paid at Philadelphia, Pa. Title registered in U. S. Patent Office

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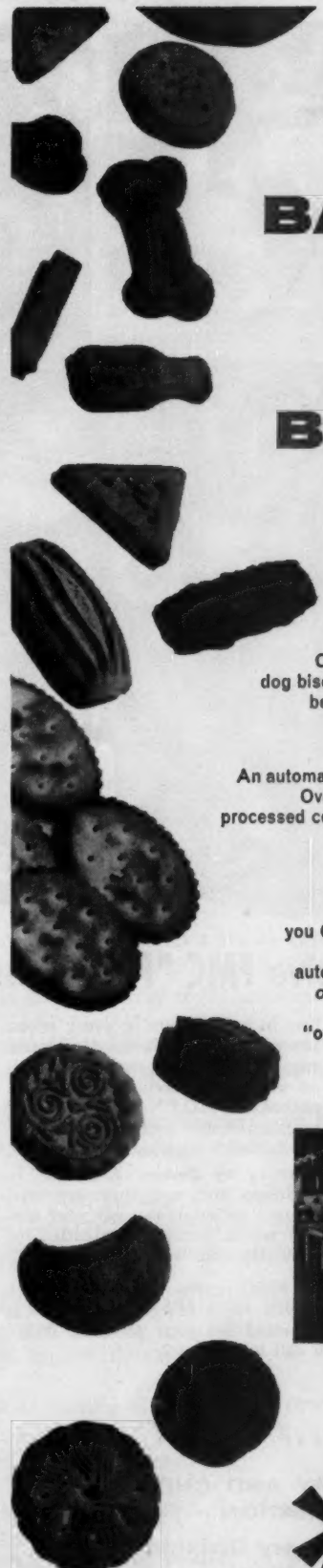


WERNER BAKED IS BETTER BAKED

Cookies . . . snacks . . . crackers . . . pretzels . . . dog biscuits . . . cereals . . . whatever the product may be, if one step of production involves BAKING, you can bake it BETTER with efficiency-engineered WERNER equipment!

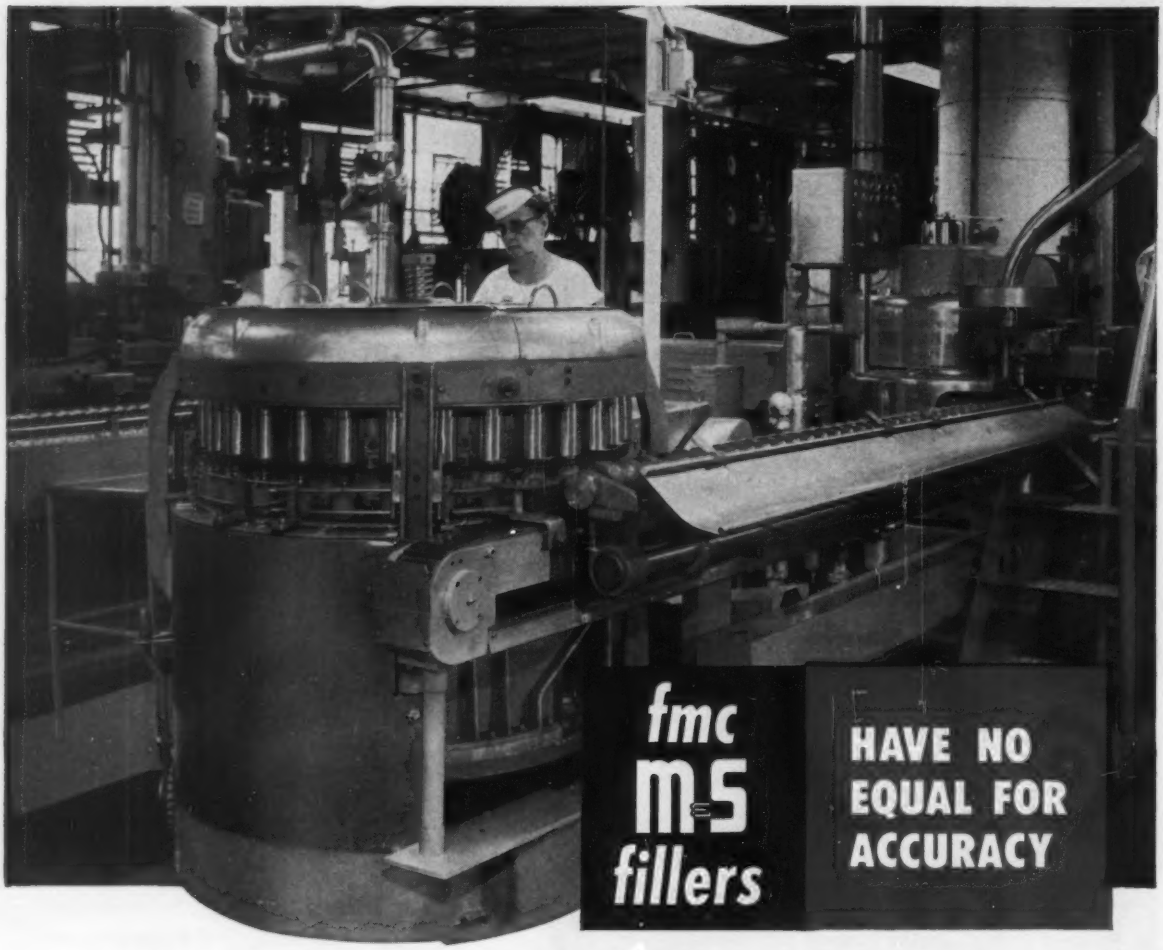
An automatically controlled WERNER Recirculating Heat Oven assures just the right touch of toasting for processed cereals, for instance. And WERNER engineers can deliver toppers, choppers, sprayers or enrobers, precision coordinated to deliver high volume production.

If your product is baked—*in part or in total*—you CAN bake it better, faster, more economically with a WERNER Oven! Recirculation of automatically "conditioned" heated air *within the oven* cuts fuel costs up to 50%, speeds baking time, eliminates the need of a full-time "oven man" . . . and reduces waste by assuring uniform quality of baking *without variance in flavor or texture!*

FIND OUT HOW YOUR PRODUCT can benefit from the precision engineering that has created the highest efficiency band oven in the industry. WRITE FOR ILLUSTRATED FIELD REPORTS.

Werner Machinery Company
1765 ALPINE, N.W., GRAND RAPIDS 4, MICH., U.S.A.

M&S 30 Pocket Filler combines high speed and accuracy filling baby foods at Beech Nut's Rochester, New York plant.



Featuring Exclusive FMC "Pre-Measuring" Principle

Actual comparison testing proves that M & S Positive Displacement Type Fillers provide the most profitable combination of the four "most wanted" filler features:

1. **High Accuracy.** Exclusive pre-measuring principle of M & S insures consistent close-tolerance filling for higher case yield per batch of product.
2. **Low Maintenance.** Rugged construction and precision engineering of M & S Fillers assure long life and dependability under the toughest, heaviest production schedules.
3. **High Speed Operation.** The M & S line includes fillers in every speed range—equalling the speed of latest cappers and closing machines—with no sacrifice in accuracy. The new, exclusive FMC "No can—No fill" mechanism for each valve, is now available for high speed operations.
4. **Sanitary by Design.** Available in stainless and non-corrosive type contact materials to meet your specific needs. Quickly dismantled for easy cleaning.

Your FMC representative will gladly show you which M & S Filler Model is best suited for your product. Won't you call him today?

MODELS FOR MOST LIQUID, SEMI-LIQUID AND HEAVY SEMI-SOLID PRODUCTS

FMC-M&S Plunger or Piston Fillers are built in 6, 9, 10, 12, 15, 20 and 30 pocket sizes. They are designed on the time-proven principle of product pre-measurement and positive ejection into containers by precision pistons. When you specify M&S, you buy the filler recognized as the "Standard of the filling industry" for more than 70 years.

Send for free copy of Bulletin No. 501E, "Fillers by FMC."

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices:

WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

TRENDS & FORECASTS

U.S. Agricultural exports increased 22% last year to $4.8 billion. Biggest increase was to Far East, 53.8%. Next, Japan, 45.3%. Others, Near East and Africa, 24.7%; Western Europe, 13.6%; Canada, 12.2%. Exports to 20 American Republics decreased 6.3%.

Output per man hour in food factories increased 2.7% per year from '47 to '58, according to USDA. All-industry gain, 3.5%.

Prices at grocery stores in '60 averaged about 2% less than in '58, and same as in '52, GMA reports.

One-fifth of grocery bill goes for taxes, GMA calculates. Taxes exceeded food bill in '60 by 47%. In '39, food exceeded taxes 26%.

Sugar stocks in 40 countries at end of '59-'60 season were slightly larger than year earlier—8.3 million tons—USDA reports.

World production of centrifugal sugar is expected to surge upward by 4 million short tons, raw value, in '60-'61 season.

Production of narrow-neck glass containers for food gained 9% in '60 to $17.6 million gross. Beer non-returnables jumped 37%.

Frozen food averaged 4.5% of supermarket sales last year, compared to 4.3% in '58 and 3.5% in '54, Supermarket Institute reports. Non-foods accounted for 5.4%, compared to 3.5% in '54.

Frozen vegetables in warehouses on April 1 were 30% above '60, or 797 million lb. Fruits were up 8% to 346 million lb.

Canned soft drink sales increased 49.6% in '60, exceeding 811.9 million cans, American Can Co. reports.

Sales of non-fat dry milk reached all-time high of 922.4 million lb. in '60, up 11.5%. Biggest use gains were 59.8% in prepared dry mixes and 22.4% in meat items. Home use gained 6.1%.

Poultry used in processing increased 77.5% in 1st quarter of '61, compared to year ago. Biggest gains were for young chickens, up 180%, and turkeys, up 69%, according to USDA.

Pack of canned white potatoes increased 17.7% in '60-'61, to 4 million actual cases. Sweetpotato pack dropped 22.6% to 4.84 million actual cases, NCA reports.

Turkey crop is up 20%, National Turkey Federation reports.

Exports of frozen poultry to West Germany in '60 amounted to 79 million lb. Almost 80% were chickens and turkeys.

See Developments to Watch p. 11

Send us your carton (even if you love it). If we can't beat it on design, printing and strength, at no increase in cost, our name isn't **Olin**

PACKAGING DIVISION

FOREST PRODUCTS OPERATIONS,
P.O. BOX 1225, WEST MONROE, LA.

Schedule of Events

June

5-9—Nat'l Plastics Exposition, New York Coliseum, NYC.
11-15—Nat'l Confectioner's Assn., 78th Annual Convention & Exposition, Conrad Hilton Hotel, Chicago.
18-22—Nat'l Assn. of Retail Grocers of the U. S., 62nd Annual Convention & Exhibit, Convention Hall, Philadelphia.
18-23—Assn. of Food & Drug Officials of the U. S., Nat'l Conference, Mayflower Hotel, Washington, D. C.
19-21—American Marketing Assn., Nat'l Conference, Los Angeles Ambassador Hotel, Los Angeles.
21-24—Processed Apples Institute, Inc., 10th annual meeting, Greenbrier White Sulphur Springs, W. Va.
23-24—American Society of Enologists, 11th annual meeting, Hoberg's Lake County, Calif.

July

18-21—Nat'l Food Distributors Assn., meeting, Commodore Hotel, NYC.
24-26—Internat'l Apple Assn., meeting, Hotel Sherman, Chicago.

HORS D'OEUVRES

▸ Browning of foods for color and taste appeal often involves very complex chemical reactions. But don't tell FDA.

▸ **Why should food look attractive? We quote Louis E. Waxman, Colonial Beef Co.'s president: "The eye eats first."**

▸ And in the words of Loren B. Sjöström, of Arthur D. Little, good food provides "entertainment in the mouth."

▸ **Comedian Myron Cohen says that new food products succeed because they taste like they are necessary."**

▸ Housewives save money by using processed foods. And these handy items get them out of the kitchen in time to enjoy their savings.

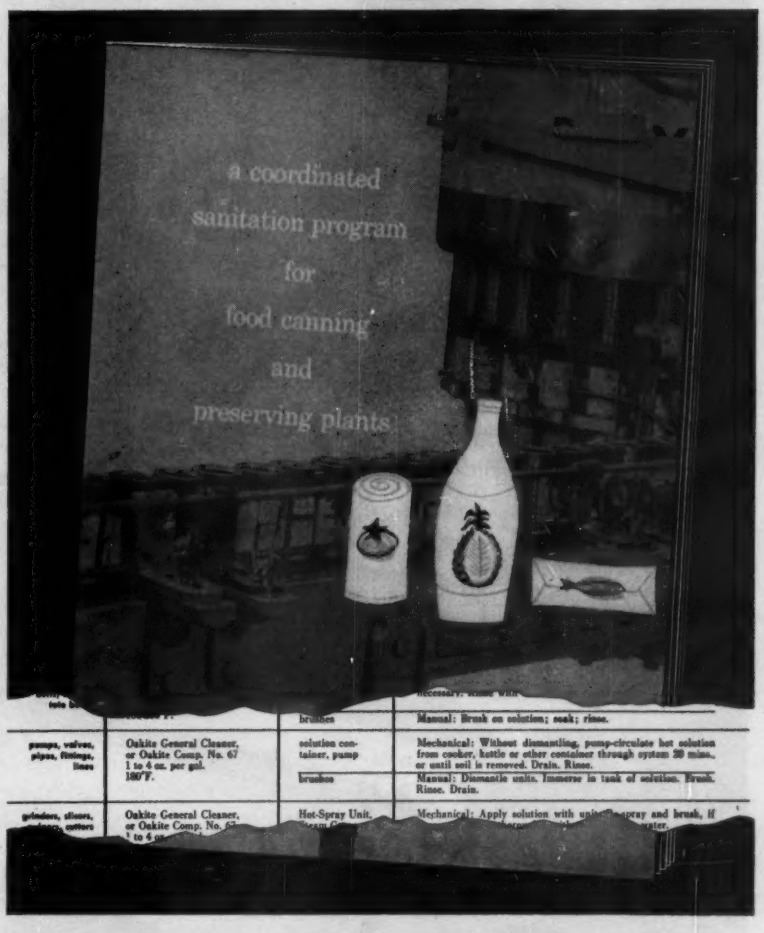
▸ **While enriched white bread was wiping out deficiency diseases a decade ago, "stone ground" backwoods breads stole the health show. Now they call bread enrichment the "quiet miracle."**

▸ Slogan on aerosol can of Spray O'Garlic reads: "Leaves you breathless!" Leaves whom breathless?

▸ **American factory worker now can buy with 38 hours of work the same monthly market basket that cost 61 hours in 1947. It is not that food is cheap, but that labor is so expensive.**

▸ If peanuts ever were blanched by hand by poor Southern families, as reported in this column, the practice no longer exists, National Peanut Council assures FE. Blanchers have joined the "Look! No hands!" circle of advanced food processors.

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite



Send today for valuable bulletin on

Canning Plant Cleaning Techniques

Detailed data charts in this bulletin give latest advanced techniques for cleaning and sanitizing food processing facilities. They describe the detergent, solution strength, solution temperature, application equipment and one or more recommended methods for solving more than 20 different *types* of cleaning problems. See example above.

Other sections discuss Sanitation, Detergency, Conveyor Chain Lubrication, Mechanized Cleaning. Helpful, factual literature like this is just one of the Big Plus factors you get when you deal with your local Oakite man. Send for your free copy of *A Coordinated Sanitation Program for Food Canning and Preserving Plants* today! Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE

over 50 *Est. 1909* SCIENCE *years' leadership in industrial cleaning*

← CIRCLE 8 ON INQUIRY CARD

CIRCLE 9 ON INQUIRY CARD

Flour whooshes through hose and saves a bakery $250

USING B.F.Goodrich hose, these men are loading a special railroad car with flour at an 800-pound-a-minute clip. Every car loaded this way saves some bakery the $250 extra it would cost to deliver the flour in 100-pound bags. Using hose, it takes only 3 hours to load a car.

To make this "filling station" method practical, B.F. Goodrich engineers came up with a special lightweight hose that's easy to pull around and won't flatten or kink on sharp corners. Workers say that this hose is a cinch to operate. Just hook it to a hatch, turn on the blower, and let the car fill.

Special hose for flour is only one of the many products developed for food processors by B.F.Goodrich. Others include mildew-resistant and grease-defiant conveyor belts, rigid vinyl pipe acids can't ruin, and washdown hose, steam-cleaning hose, and beverage hose.

To get all the facts about BFG products, call your B.F.Goodrich distributor. As a factory-trained specialist in rubber products, he can help you select the right product for the specific job to be done. *B.F.Goodrich Industrial Products Company, Dept. M-106, Akron 18, Ohio.*

B.F.Goodrich

DEVELOPMENTS TO WATCH

First freeze-dried products on consumer market are meat items for campers introduced in June by Armour. Packer also produces freeze-dried foods for Armed Forces.

Additional freeze-drying equipment is being installed by United Fruit in Texas to increase production for institutional market.

Freeze-drying symposium will be held in London, Oct. 19-20, at Borough Polytechnic, on techniques, equipment, and nutrition.

Quick rehydration to permit serving after 5-min. simmer is achieved by new USDA technique. Partially dehydrated vegetables are made porous by pressure-cooking, then releasing pressure.

Continuous malting has proved successful at Dominion Malting, Toronto. Germinated barley moves through machine in deep beds on series of perforated decks and emerges as malt.

Blocks of fish 4 in. thick are frozen in 3½ hr. by vertical plate freezer developed at Torry Research Station. Plates swing open and hot gas passes through them to release block.

Bulk milk tank of 202 stainless steel resisted corrosion 3½ yr. in Pennsylvania State test. Manganese replaces nickel to large extent in 202, reducing cost.

Spoilage is increased by washing eggs in water containing high concentration of iron (5-10 ppm.) in solution, USDA reports. Iron reverses protection action of egg's conalbumin.

To avoid high moisture loss during defrosting, frozen donuts should be packaged, says American Institute of Baking.

Antioxidant that disperses in aqueous phase, as in fish, has been found by Eastman. It is gentisic acid, or its sodium salt.

Deodorized kerosene has helped triple beta-carotene yields in new fermentation technique developed by USDA. Kerosene is added to mold nutrient medium.

See Who's Building What p. 15

Vitamin B_6 reduces dental decay, says R. W. Hillman, New York College of Medicine. Vitamin apparently spurs growth of harmless bacteria at expense of decay-causing microbes.

Washington Report p. 21

Brass Rail restaurants are producing frozen precooked meals to be served in industrial cafeterias via new hot-vend machine.

New $1.6 million food science teaching and research center will be built at University of Massachusetts.

What will the foods of the future be like ?

PFIZER PRODUCTS FOR THE FOOD INDUSTRY
MILLING & BAKING
Bi-Cap (flour enrichment mixtures), L-Lysine, Glucono Delta-Lactone, Cream of Tartar, Citric Acid, Sorbistat (Sorbic Acid), Sorbistat-K (Potassium Sorbate), Sodium Benzoate, B Vitamins, Sof-U-Pak
DESSERT
Citric Acid, Ascorbic Acid, Sodium Citrate, Fumaric Acid, Calcium Cyclamate, Calcium Gluconate, Sorbistat (Sorbic Acid), Sorbistat-K (Potassium Sorbate)
CANDY
Citric Acid, Ascorbic Acid, Calcium Cyclamate, Tartaric Acid, Cream of Tartar, Sorbistat (Sorbic Acid)
FROZEN FOOD
Citric Acid, Ascorbic Acid, A-C-M
MEAT PACKING
Citric Acid, Ascorbic Acid, Erythorbic Acid (Isoascorbic Acid), Sodium Erythorbate (Sodium Isoascorbate), Sodium Ascorbate, Biostat-PA (Oxytetracycline), Sodium Citrate
DAIRY
Citric Acid, Sodium Citrate, Vitamin A, Sorbistat (Sorbic Acid), Sorbistat-K (Potassium Sorbate), Vitamin A Palmitate, Types M & W
OIL & FAT PRODUCTS
Vitamin A & D, Beta Carotene, Citric Acid, Sodium Benzoate
CANNING PRESERVING
Citric Acid, Ascorbic Acid, Sodium Citrate, Calcium Cyclamate, Sodium Benzoate, Tartaric Acid
BEVERAGE
Citric Acid, Ascorbic Acid, Sodium Citrate, Sorbistat-K (Potassium Sorbate), Calcium Cyclamate, Sodium Benzoate, Tartaric Acid, Caffeine, Erythorbic Acid (Isoascorbic Acid)

Whatever the form or content of tomorrow's foods, they will owe something to the research laboratory of today. If you are working to develop new food products, or to improve present ones, the end to your search may be as close at hand as your Pfizer representative.

The name Pfizer has been synonymous with highest quality ingredients and service for the food industry for more than 110 years. This reputation results, in no small way, from the contributions of Pfizer Technical Service.

Our customers have come to rely on our many products and on our readily available technical service "team" at every stage of product development—from research to finished production.

For example, when manufacturers of "convenience" mixes—general-purpose and specialty baked goods—wanted a more controlled type of leavening action, Pfizer offered Glucono-Delta-Lactone. This chemical leavening acid imparts no unpleasant aftertaste, yet helps provide products having excellent volume and fine even texture. G-D-L's high stability in storage also insures longer shelf life.

Mold and yeast growth had been causing food-freshness problems in cheese, wines, prepared salads, and baked goods. Today, Pfizer Sorbistat®-K and Sorbistat® provide the means to ensure a "stay fresher longer" quality in such products.

In the nutritional area, Pfizer L-LYSINE has made possible great strides in improving the protein quality of grain-based foods ranging from breads to breakfast cereals . . . without affecting the taste or texture of the product. This essential amino acid "activates" the protein potential present, thus improving the total protein quality.

These few examples merely typify Pfizer's experience and willingness to help. Let us prove that our products and personnel can help solve your problems.

If you have a food product problem, look to Pfizer first.

Science for the world's well-being®

Pfizer

CHEMICAL DIVISION

Chas. Pfizer & Co., Inc.
Chemical Division
New York 17, N. Y.

This is a Knife

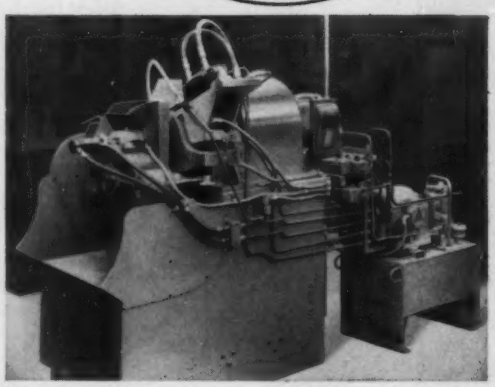
. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for an *Urschel machine*

It is the most important part of the machine because it cuts the product. The thickness of this knife is controlled to less than one ten-thousandth of an inch. Knives of such accuracy have *never* been made by others. This accuracy makes it possible to stack many knives on a knife spindle with such precision that knives can be replaced without adjustment and without having the knife rub against mating parts. This accuracy helps to reduce maintenance to a minimum.
Induction heating is used to harden only the edge of the knife to a greater hardness than would be practical to harden the entire knife. The hard edge causes the knife to stay sharp for an extended period. Soft material backs up the hard edge so that the knife will bend rather than break into fragments if the knife strikes a foreign object.
The selection of stainless steel in this knife and its treatment is based upon many years of metallurgical experience in the testing of stainless steels for the cutting of food products.

Closeup of specially treated Urschel knife edge

This is a Machine

. . . it was *designed* by Urschel
. . . it was *engineered* by Urschel
. . . it was *manufactured* by Urschel
for the *making of Urschel knives*



This is only one of many machines made in the Urschel shops for the manufacturing of knives. Standard machine tools cannot be purchased for the economical making of Urschel knives for the required rigid specifications. Research is continuously carried on at Urschel Laboratories in search of better methods and better materials for the manufacture of knives.

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products.

Who's Building What

Monthly Reports: These food firms will spend $13,129,794 for expansion.

Contracts Awarded

Anheuser Busch Inc., St. Louis, Mo., plant, $241,000; beer storage tanks, $2,500,000.

Armour & Co., Kankakee, Ill., edible oil processing plant, $4,500,000.

Big Seven Cannery Inc., Big Stone Gap, Va., cannery, $131,798.

Canada Dry Bottling Co., Worcester, Mass., plant addn., $117,000.

Carling Brewing Co., Frankenmuth, Mich., brewing plant addn., $1,500,000.

The Coca-Cola Co., St. Louis, Mo., bulk sugar & commodities warehouse, $400,000.

J. S. Dillon & Sons Stores Co., Lawrence, Kan., baking plant, $200,000.

Falstaff Brewing Co., Omaha, Neb., warehouse addn., $125,000.

Irvindale Farms Inc., Atlanta, Ga., dairy plant addn., $171,496.

Nissen Baking Corp., Lynn, Mass., bakery addn., $118,000.

Pepsi-Cola Bottling Co., Rome, Ga., bottling plant, $125,000.

John Reber Baking Corp., Wayne, N. J., plant, $600,000.

Rowan Dairy, Salisbury, N. C., dairy plant addn., $175,500.

Southern Frozen Foods Inc., Montezuma, Ga., cold storage warehouse, $500,000.

Tennessee Packers Inc., Clarksville, Tenn., meat packing plant, $125,000.

White Packing Co., Lewes, Del., meat packing plant addn., $110,000.

Proposed Projects

Eagle Lake Rice Dryer, Eagle Lake, Tex., rice storage facilities, $115,000.

Foremost Dairies Inc., Houston, Tex., milk processing plant, $425,000.

Gebhardt's Mexican Foods, San Antonio, Tex., plant expansion, $500,000.

Janak Packing Co., Hallettsville, Tex., packing plant imprvs., enlargement, $125,000.

Pepsi-Cola Bottling Co., Covington, Ky., warehouse, $325,000.

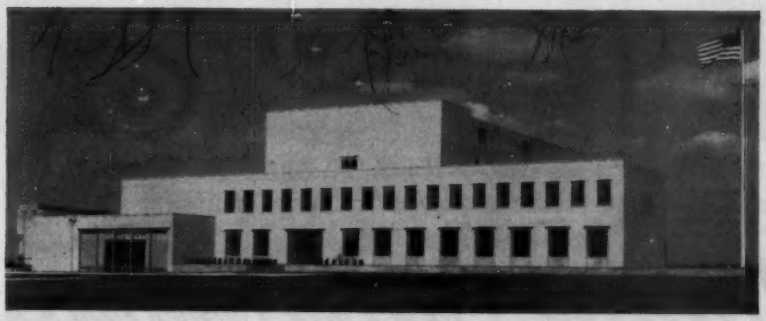
Other Construction News

Chock Full O'Nuts Corp. is building world's largest doughnut plant in Secaucus, N. J., and will begin marketing frozen product this fall.

Dad's Old Fashioned Root Beer will begin servicing southeastern U. S. with planned construction of bottling plant in Hialeah, Fla.

General Foods Corp. plans construction of district sales and distribution center in Dallas, Tex., which will complete its nation-wide network of 16 market-centered food distribution facilities.

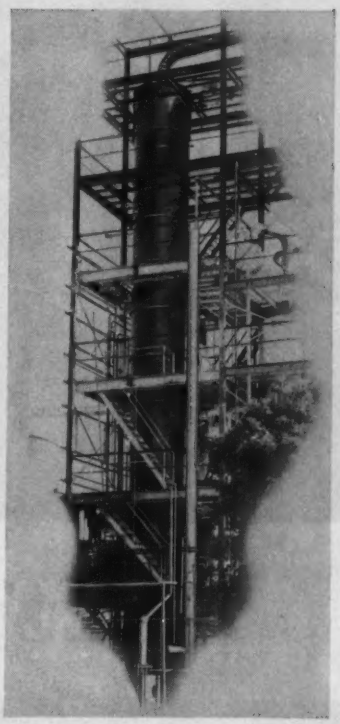
American Machine & Foundry Co. will erect the most modern bakery in the Far East when they begin construction of Akebono Fresh Bread Co.'s Tokyo plant.



NEW RESEARCH CENTER of A. E. Staley Mfg. Co. in Decatur, Ill., is three-wing structure, dedicated to developing new and more useful corn, soybean, and chemical products for nation's consumers, food, chemical, and other industries.

this **FRACTIONATING COLUMN**

*was custom-engineered to do a specific job for our client.**



* A world-famous California winery uses this Thermovac fabricated fractionating column with auxiliary equipment to capture and preserve the delicate and elusive "bouquet" that is so essential to fine wines.

THERMOVAC will custom-engineer and fabricate the processing equipment best for your job!

- Evaporators
- Heat Exchangers
- Process Automation
- Rotary Coil and Steam Jacketed Kettles
- Specialized equipment for the Food and Chemical Industries.

Write or call for immediate service; expert consultation!

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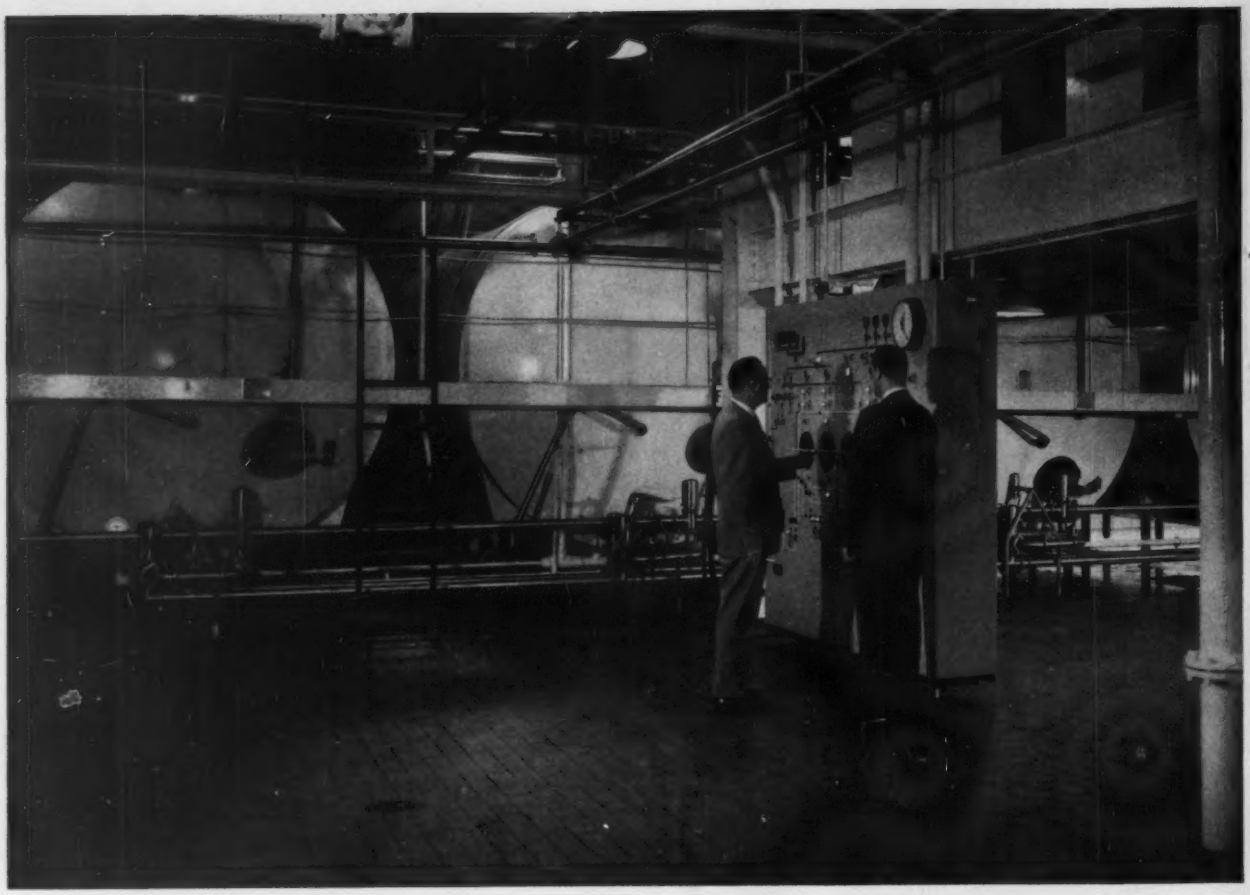


NESTLÉ puts the accent on

Shown above are two of the highly sophisticated "Cleaned-In-Place" systems in The Nestle Company's plant in Fulton, New York. This is Nestle's principal U. S. plant for processing chocolate bars, bulk chocolate, cocoas, chocolate drink mixes, etc. Designed by Cherry-Burrell Corporation, working closely with Taylor Application Engineers, these CIP systems do a thorough job of cleaning all tanks, pipes and valves in both fresh and processed milk handling systems. Also, of course, the hazard of scarring the insides of the equipment is eliminated.

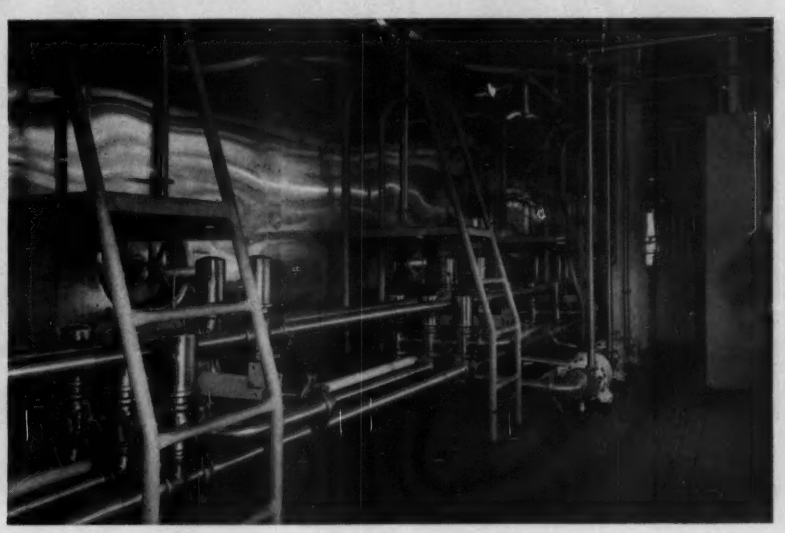
Inset photo above shows the rear view of the Taylor-built CIP panel for the fresh milk storage tanks. The Taylor ROBOTRON Timer (lower right) regulates the sequence and duration of each step in the CIP cycle. Fully automatic, it assures absolute certainty of cleaning without waste of time or chemicals.

If you are thinking of CIP, be sure to specify "Taylor equipped as usual." Your Taylor Field Engineer will be glad to specify the required instrumentation. Or you can contact your preferred equipment supplier or source of cleaning chemicals. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Ontario.

Taylor Instruments

Taylor-built control panel for the fresh milk CIP system at The Nestle Company, Inc., Fulton, N. Y. Taylor actuators are on all CIP valves serving fresh milk storage tanks in background. Rear view of this panel shown in inset photo.

Taylor-built control panel (side view, right) sequences the CIP system used on these huge processed-milk tanks and associated equipment. Note the many Taylor actuators on the CIP valves which are controlled by another Taylor ROBOTRON* *Timer.*



CIP and on Taylor Controls!

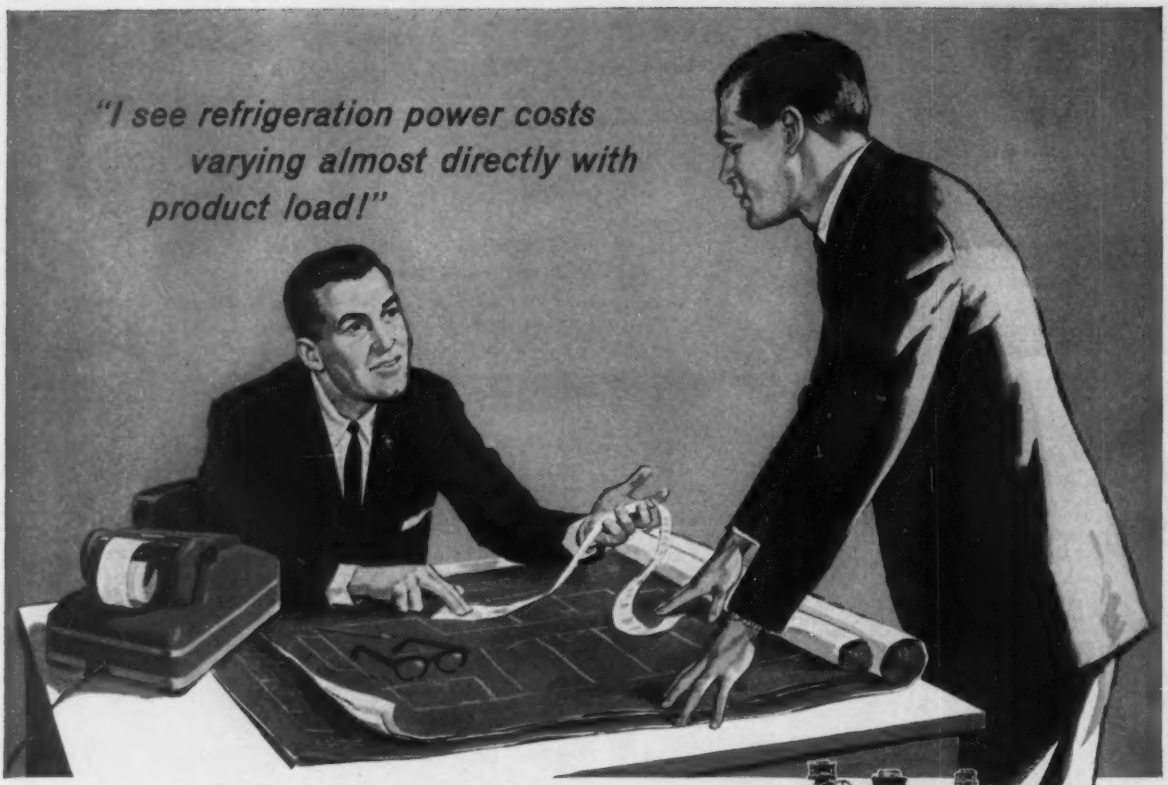
This is where powdered products are dried and cooled. The Taylor-built panel controls these operations and the pneumatic transportation of dry materials.

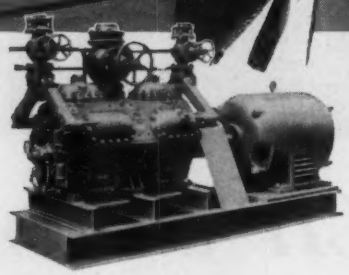
Typical of other Taylor Control Systems in the NESTLÉ plant at Fulton, N. Y.

Bulk sugar is stored in these giant silos. It is automatically conveyed from railroad car to silo to processing equipment from this Taylor-built panel.

*Trade-Mark

MEAN ACCURACY FIRST





YORK V/W Compressors Use Only 28% Power At 25% Load

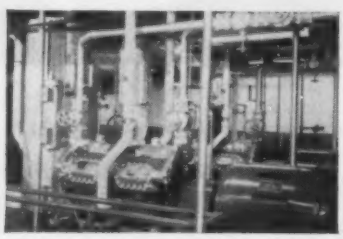
—Gives you almost straight-line savings

MORE FLEXIBLE SCHEDULING—York V/W Compressors step-unload down to 25% capacity with power savings in almost direct proportion to output. This automatic capacity reduction gives you freedom in scheduling—you can base your operation on product load, not on fixed compressor capacity.

GREATER CAPACITY IN LESS SPACE—Space-saving V/W design packs high capacity into minimum floor area and head room. This enables you to replace old-style compressors and get more capacity into the same space. No need for costly engine room additions or building expansions.

LOCATE ANYWHERE CONVENIENT—V/W Compressors are statically and dynamically balanced to assure smooth, quiet, vibration-free operation. Unit needs no expensive foundation—can be located anywhere, remote from main engine room and even on upper floors, eliminating long refrigerant lines.

EASY TO MAINTAIN—All parts subject to wear quickly replaceable with simple hand tools...profit-cutting down-time virtually eliminated. A York Certified Maintenance Contract further assures continuous operation. Ammonia and halocarbon refrigerant units available up to 200 tons capacity.



Another YORK Trail Blazer Concept Proved In Action
Detroit Refrigerating Div., Beatrice Foods Co.—The 40-year old horizontal compressors in this 1,980,000 cu. ft. cold storage warehouse were replaced with York V/W units to provide more efficient, automatic operation. The new system maintains constant temperatures with little or no attention.

YORK CORPORATION
Subsidiary of Borg-Warner Corp.
YORK, PENNSYLVANIA

2206 SOUTH GRANTLEY ROAD, YORK, PENNSYLVANIA

Air Conditioning, Heating, Refrigeration and Ice-Making Equipment • Products for Home, Commercial and Industrial Applications

Keep Faith with Nature—Guard her Goodness

In your juice or blend . . .

STANDARDIZE—*don't jeopardize*

Nature never standardizes the vitamin C content of fruits. Nature's never uniform. Uniformity varies. So *standardize*—don't jeopardize—juice uniformity!

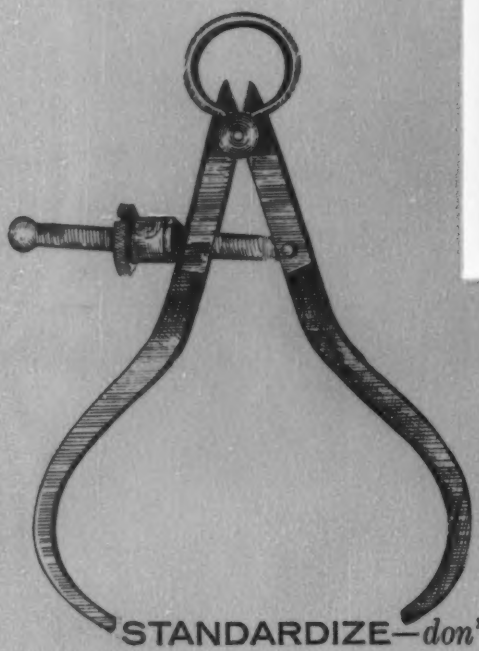
Standardize on juice excellence, with Roche® vitamin C (ascorbic acid). Capitalize on quality. Give fruit juices and blends: acceptable vitamin C levels, ripe-fruit-flavor richness, a nutritional claim for your labels.

©1960 HLR INC.

FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.** Nutley 10, New Jersey

Keep Faith With Nature—Guard Her Goodness

In your juice or blend . . .



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Nature never standardizes the vitamin C content of fruits. Nature's never uniform. Uniformity varies. So standardize —don't jeopardize—juice uniformity.

Standardize on juice excellence, with Roche® vitamin C (ascorbic acid). Capitalize on quality. Give fruit juices and their blends: acceptable vitamin C levels, ripe-fruit-flavor richness, a nutritional label claim.

©1960 HLR INC. FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.** Nutley 10, New Jersey

Washington Report

Tighter plant probing targeted . . . How new wage law affects you . . . FTC challenged . . .

Seek to Expand Factory Snooping

A far-reaching plant inspection law now looms as big threat. FDA wants its inspectors to have the right to examine any or all books, records, or formulae of processors, plus unrestricted right to inspect any plant process.

Legislative timetable calls for enactment in '62—an election year.

New proposal puts food packers in a ticklish box. Such a law has obvious appeal in the name of "public safety." And good reputations can be blackened by sly suggestions that manufacturer may have "something to hide" if he opposes it. But industry sources ask, **why should a soupmaker, for example, tell exactly how he makes chowder?**

Dilemma facing processors: Oppose tighter restrictions and run the risk of bad public relations. Or do nothing and be forced to turn over secret formulae, production and sales data.

Wage Law Booby-Traps

New federal minimum wage statute has a couple of long-range threats for the food field.

Significantly, it calls for a study of exempt industries with a view to ending such status. Canners, for example, will be forced to defend their present 28 weeks' exemption.

Pressure for higher wages across the board will build up. As lower-paid workers get their increase under the law, higher-paid employees will demand more to maintain historic wage spread.

Here are law's key points:

1) Coverage is greatly expanded. Previously, only those workers specifically engaged in production of goods for interstate commerce were covered. **Now, if your sales are $1 million or more a year, and two or more workers are engaged in interstate commerce, your whole business (and all employees) is covered by the law.**

2) Employees previously covered go from $1 to $1.15/hr. for first 2 yrs. after effective date (Sept. 3), then go to $1.25 after that period.

3) Newly-covered workers get $1/hr. in first 2 yrs. with nothing extra for overtime; $1/hr. in 3rd yr. with overtime (time and a half) after 44 hrs., $1.15 in 4th yr. with overtime after 42 hrs., and $1.25 in 5th yr. with overtime after 40 hrs.

FTC Curbs Face Big Court Test

How broad is Federal Trade Commission's power to stop illegal trade practices? U. S. Supreme will wrestle with that poser in its next term as the result of a new appeal in the Henry Broch case. Last June, high court ruled against broker, holding that he couldn't pass part of his commission along to customer, and remanded case back to Chicago appeals court.

Lower tribunal recently held that FTC's order was "unduly broad" and inhibited all future Broch activities. FTC insists that an illegal act is illegal for all parties and for all time. Otherwise, it argues, its staff will be tied up making specific complaints against individual practices.

Mark Time on Deceptive Packages

FDA told field offices to be especially watchful for short-weighted and slack-filled packages. Agency won't say what products are under suspicion. "We can't tip our hand," FDA executive tells FOOD Engineering, "but if our hunches are right, we may have some legal actions under way before long."

'Arise Ye Complainers . . .'

New Frontier keeps urging consumers to speak up. USDA Secty. Freeman is enlarging his National Agricultural Advisory Commission from 18 to 25 members, with emphasis on consumer interests. NAAC, set up in '53 as a kind of citizens' advisory panel, has played a quiet role, steering clear of special causes. Freeman plans to inject some political ginger into it by playing up "consumer angle."

BRIEFS

Industry petitions concerning use or termination of additives can be signed by assistant commissioners, FDA ruled.

Whether new laws are needed to curb "deceptive packaging" will highlight upcoming hearings of Senate antitrust subcommittee, headed by Sen. Hart (D-Mich.). Sessions begin end of June.

Expanded studies of fats in foods will be made by USDA. Dept. wants its research budget to be increased from $74 to $80 million.

U. S. Public Health Service will study bacterial standards in milk field to see if they are adequate in light of modern handling and processing methods. Planned survey of large companies has been put off "indefinitely," Census Bureau says. (Turn page)

Now, with Avcold, you can meet the new frozen-food codes

(You get unitized loading, too!)

Meets AFDOUS standards. Keeps 1500 lbs. or 39 cu. ft. frozen for hours, from storage to retailer, without refrigeration or dry ice.

Easy to handle. Lifts with handjack or forktruck. **Rugged construction.** Steel, aluminum, foamed-in-place polyurethane insulation. 40" x 40" x 65".

For details, send coupon. No obligation.

Avco/Nashville

AVCOLD, NASHVILLE DIVISION
AVCO CORP., BOX 6-1, NASHVILLE, TENN.

Please send complete Avcold information.

Name_____

Address_____

City_____ State_____

Firm_____

Title_____

Washington Report *(Continued)*

International Assn. of Ice Cream Mfrs. filed with FDA for amendments to ice cream standards permitting greater amounts of sugar, used in conjunction with chocolate and cocoa, to be taken into account in calculating reduction below 10% bf and 20% TMS in chocolate ice cream.

Present order provides only ½ lb. of sugar to each pound of chocolate or cocoa solids. IAICM's proposed amendment would increase the amount to 1.5 lbs.

Canned Clingstone, freestone peaches and apricots are slated for standards revision. Proposals provide for revised recommended drained weights and fill weight procedure for all three products.

Quality Level of U. S. No. 2 grade apples for processing is raised by reducing from 25 to 12% the amount of waste permitted for certain defects, according to standards revisions effective June 1.

National Canners Assn. has submitted proposals to FDA for adoption of a definition and standard of identity for artificially sweetened canned pineapple.

Corn Syrup has been permitted for use in canned sweet potatoes without limitation.

Table Grapes (U. S. No. 1 grade) standards were revised, reducing from 16 to 15% the minimum soluble solids required in the Cardinal, Exotic, and Robbins varieties grown in Arizona.

FDA Approved use of Calcium Stearyl-2-Lactylate as a food additive for bread.

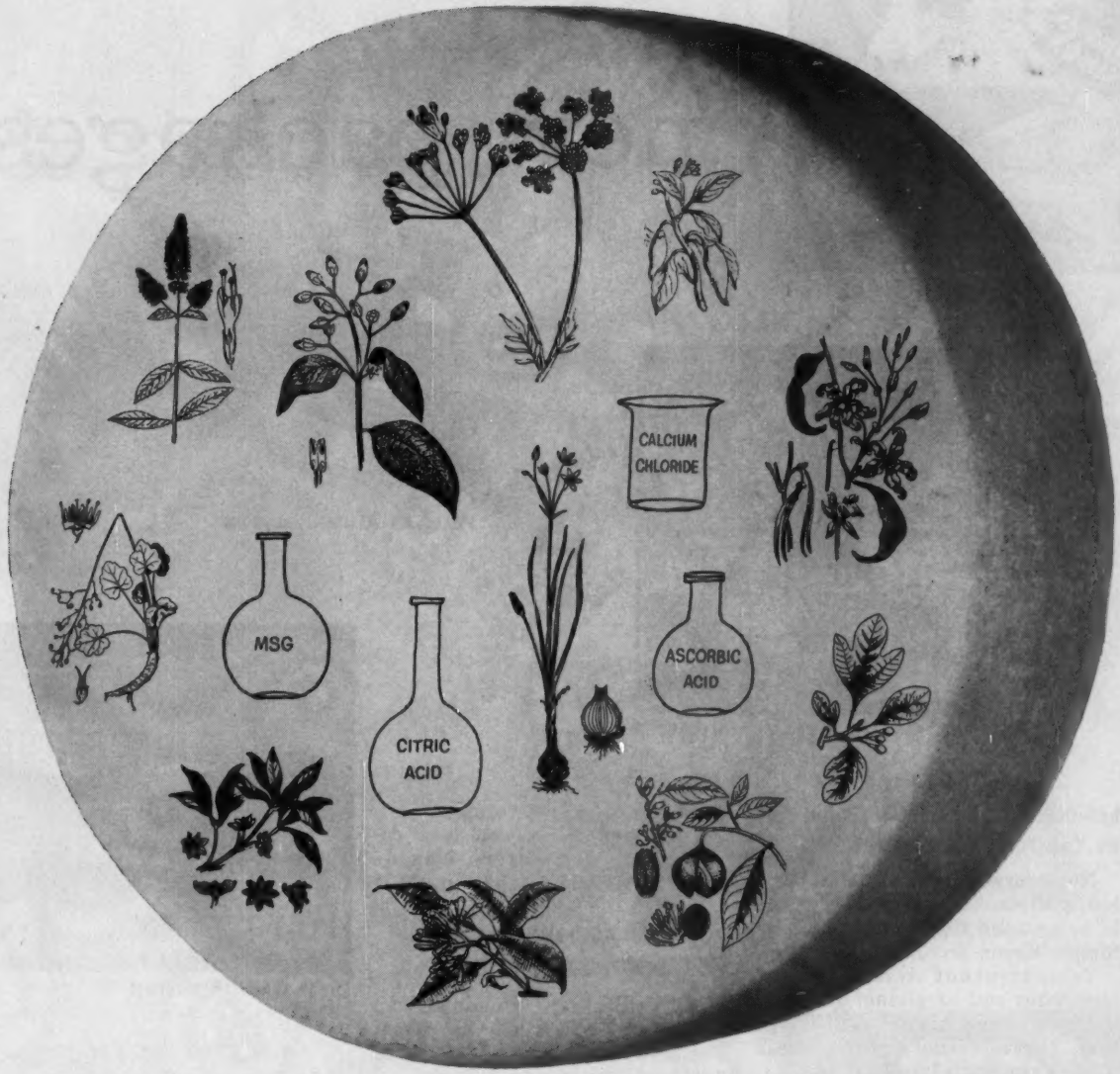
Extension of Experimental Studies for removing excess color from white wines has been undertaken by Internal Revenue Service. Tests will continue through June 30.

Proposals to make stannous chloride a permitted optional ingredient in canned asparagus packed in glass containers has been received by FDA.

FE's Box Score on Key Legislation

BILL	SPONSOR	OBJECTIVE	COMMITTEE
HR 11	Patman	Curb good faith defense to price discrimination charges.	Judiciary
HR 1825	Schadeberg	Create federal sanitation code for interstate movement of milk.	Commerce
HR 6554	Dent	Allocate funds for states with fishery research programs.	Merchant Marine
HR 6733	Hansen		
HR 6631	Lane	Impose ad valorem duty of 35% on unprocessed shrimp imports.	Ways & Means
HR 6764	Saund	Extend import restrictions to shelled walnuts, dates.	Agriculture
HR 6946	Dole	Set minimum price support for wheat at $2/bushel.	Agriculture
HR 6981	Nygaard		
HR 7060	Matthews	Amend licensing provisions of Perishables Commodities Act.	Agriculture
HR 7064	Reifel	Make matching-grant funds available to State agricultural experiment stations for expanded facilities.	Agriculture
HR 7083	Cohelan	Provide grants for adult education for migrant workers.	Education & Labor
HR 7087	Cohelan	Amend exemption of agricultural employees from child labor provisions of Fair Labor Standards Act.	Education & Labor
S 11	Kefauver	Curb good faith defense to price discrimination charges.	Judiciary
S 167	Kefauver	Expand Justice Dept.'s power to inspect industry records for enforcement of antitrust laws.	Judiciary
S 467	Hartke	Allow expenditures for legislative purposes to be deducted from income taxes.	Finance
S 606	Bush	Create fishery research center at Milford, Conn.	Commerce
S 714	Johnston	Authorize Secty. of Agriculture to set up formal program for increased use of agricultural products for industrial purposes.	Agriculture
S 1688	Kefauver	Establish a Dept. of Consumers which will represent consumer interests before courts and regulatory agencies, conduct economic surveys, and absorb FDA and parts of USDA, Labor Dept., and National Bureau of Standards.	Government Operations
S 1873	Young	Allow CCC to donate dairy products to college home economics courses.	Agriculture

		ACTION TAKEN	STATUS
HR 2010	Gathings	Extend use of Mexican workers on American farms.	Agriculture subcommittee cut proposed 4-yr. extension to 2 yrs.
HR 2982	Celler	Require 60 days notice by corporations planning to merge.	Hearings held by House Antitrust subcommittee.
S 166	Kefauver		
HR 6400	Cooley	Administration's omnibus farm bill. Extends marketing order controls to all canning commodities.	Hearings held by Agriculture committee.
S 1734	Carroll	Speed up regulatory agencies by upgrading role of hearing examiners.	Hearings held by Judiciary subcommittee.



IF THEY CAN BE PRESSED INTO A TABLET...MORTON WILL COMBINE THEM FOR YOU!

Morton will work with either seasoning suppliers or canners to custom-produce the right flavoring tablets for every job!

As part of its complete service to canners, packers and processors, Morton Salt Company will make tablets containing the exact combination of salt and other flavoring agents desired, following the user's specifications.

In fact, Morton has, on occasion, produced tablets that do not even contain salt!

Morton combination tablets are precision made to your exact requirements. Ingredients may include any flavoring agents which can be combined into a tablet, in any size from 10-grain to 400-grain.

Morton's Complete Dispensing Service—Morton also offers a complete line of tested and approved dispensers, including Salt Tablet Depositors which deposit up to 700 tablets a minute with guaranteed accuracy. They will help you reduce costs, eliminate waste and assure better flavor control. All equipment is installed and serviced by Scientific Dispensing Company Division of Morton Salt Company.

How many things go into your product that should be combined in tablet form?

I would be interested in the possibilities of combining

_____ *in tablet form.*

Name_____

Title_____

Company_____

Address_____

City_____ State_____

MORTON SALT COMPANY

INDUSTRIAL DIVISION

Dept. FE-6

110 North Wacker Drive, Chicago 6, Illinois

new packages

TAMPER-PROOF PIE CARTON

TIE-IN END LABELS

PULL-TAB ALUMINUM CAN

PEPSI CARTON DESIGN

MARKET FROZEN PIES IN TAMPER-PROOF CARTON

Non-overwrapped, printed carton with exclusive locking device is being used for Carnation Co.'s Simple Simon frozen pie line.

Tamper-proof carton, which eliminates cost of gluing, discourages pilferage via nine locking tabs. Locks, located on three sides of package, snap into slots at bottom of side panels. Once snapped into place, tabs are anchored to inside of carton.

Up to 80 cartons/min. can be handled. Carton and packaging line, located at Carnation's Torrance, Calif., plant, were developed by Container Corp. of America. **(312)**

BREAD END LABELS SPARK TIE-IN PRODUCT SALES

End labels with an "appetizement concept" are expected to trigger impulse sales for Skylark bread marketed by Safeway Stores, Inc., Oakland, Calif.

Providing high-impact cross merchandising of private label commodities, each of eight labels features a different type of Skylark bread and ties in a related Safeway product by depicting the two in ready-to-eat form.

Packaging innovation is a development of Western-Waxide Div., Crown Zellerbach Corp. **(313)**

PULL-TAB ALUMINUM CAN FOR COTTAGE CHEESE

A "zip-opening" aluminum can has been introduced by Kraft Foods for four varieties of cheese dips in 8-oz. sizes.

Can, which replaces fluted foil cups with cardboard inset lids, has an opening pull-tab device that eliminates need for can opener, key, or lid flipper. Attached to tab is a narrow strip of aluminum which seals lid to lower can portion. Lid may be replaced for refrigerated storage.

Cans and patented closure were developed and manufactured by Central States Can Corp. **(311)**

BOTTLE SIZES DICTATE NEW PEPSI CARTON

Marketing needs, brought about by the multiplicity of soft drink bottle sizes, are cited as reason for switch in Pepsi-Cola carton design used since '56.

Pepsi, which sells in 6½, 8, 10, 12, 16, and 26-oz. sizes, expects new design to eliminate size confusion, preserve quality image, and "take charge" of beverage display area.

New cartons, regarded by bottlers as sales tools, feature vertical striping and color coding—red, blue, yellow, ochre—to designate different sizes of containers. New units, which also utilize a die-cut Pepsi crown on end panels, are produced by 12 major carton suppliers.

RE-USABLE PLASTIC CLIP SEALS POLY FILM BAGS

Plastic clip for polyethylene packaging is claimed to assure air-tight protection against humidity, leakage, and odors.

Closure, termed the Kisco-Bip, is easily slipped on and off package for re-sealing after product removal. No machinery is used in

& products

PLASTIC CLIP FOR POLY BAGS

the all-hand packaging operation.

Cost varies from 0.7¢ to 1.5¢ depending on size and quantity. Created by Kisco-Bip Corp., device is produced and distributed by John L. Rie, Inc., Yonkers, N. Y. **(314)**

UNIQUE PLASTIC PACKAGE IS SELF-MIXING

Insta-Mix Pak, a multi-compartment, self-mixing plastic package for liquid and powder components, is offered as a container for salad dressings, hot cakes, and other food products.

Package is claimed to insure freshness of precisely measured and separated active ingredients via a rupturable seal that is leakproof under shipping and handling pressures. Using proper directions, seal is easily broken by hand to dispense mixture through a controlled pouring channel.

Unit-of-use package is a development of the William Steven Co., Los Angeles. **(315)**

FROZEN BREAD DEBUTS IN AWARD-WINNING CARTON

Frozen Plantation Bread, a hit in test markets, is now expected to move into national distribution.

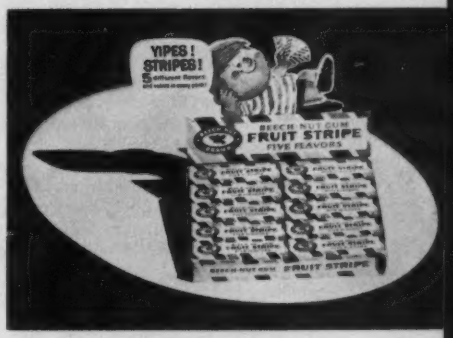
Introduced by Morton Frozen Foods Div. of Continental Baking Co., frozen bread is claimed to eliminate need for preservatives in dough and permit indefinite storage life.

Attractive, four-color carton, which features a deep-South plantation design, took two awards at competition sponsored by Folding Paper Box Assn. of America.

Carton is printed on .015 caliper solid bleached sulphate board from International Paper Co. **(316)** with Lord Baltimore Press Fidel-I-Tone fine-screen lithography. **(317)**

FROZEN PLANTATION BREAD

SELF-MIXING CONTAINER



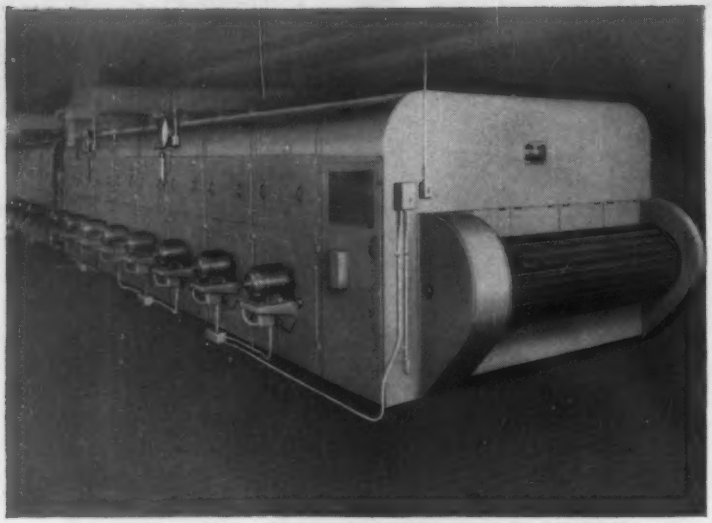
BEECH-NUT STRIPE GUM

FIVE ASSORTED FLAVORS FOR STRIPE GUM PACK

Stripe Gum, a package of five assorted fruit-flavored sticks, is achieving "remarkable" acceptance in six test markets, according to officials of Beech-Nut Life Savers, Inc.

Each gum stick is striped with the proper color for lemon, cherry,

Tomorrow's Dryer...Today!



by

SARGENT

UNIFORM DRYING of even those difficult foods with high water content — sliced potatoes and apples, for example. No unevenly dried areas — every slice is dewatered uniformly, safely, to the exact moisture content required. Color and flavor are guarded by the SARGENT system of positive control of airflow, and of zoned temperature reduction, to conform with progressively lowering moisture content of foods being dried. Production rate may be as high as you wish, with product quality protection unimpaired.

SARGENT exclusive design is geared to your product needs. The sturdy housing of a SARGENT is vibration free, streamlined; and operation of the dryer is dependable, trouble free, completely automatic. Every machine has a firm performance guarantee. The economy of a SARGENT, from cost-saving, record-quick installation, through steady quality production, to the easiest cleanout ever, cannot be equalled. Every machine has many SARGENT-engineered exclusive features to help you to easier, more economical drying of, a better, more saleable product. May we give you details? Just write or phone us.

FOOD PRODUCTS DRIED BY SARGENT INCLUDE

MILK CURD	DOG FOODS
MILK POWDER	CAT FOODS
SLICED APPLES	ANIMAL FEEDS
SLICED POTATOES	COCONUT
SLICED ONIONS	COFFEE
RICE	COCOA
TAPIOCA	MALT
BREAKFAST FOODS	WHEAT
FRUITS	OATS
BERRIES	SHRIMP
NUTS	STARCH
PROTEINS	STUFFING MIX
SOY BEANS	BIRD SEED
COTTON SEED MEAL	GARDEN SEED

EXTRUDERS • GRANULATORS • FEEDS
(Oscillating Conveyor, Hopper, Standard)
DRYERS (All types for production, Pilot Plant and Lab) • COOLERS

C. G. SARGENT'S SONS CORPORATION

Graniteville, SINCE 1852 Massachusetts

PHILADELPHIA • CINCINNATI • CHARLOTTE • ATLANTA • HOUSTON • DETROIT
NEW YORK • CHICAGO • LOS ANGELES • TORONTO

lime, orange, or mixed fruit flavor. Flavor is actually in the stick and not in color stripe.

Market research for the new product, which is priced the same as other Beech-Nut flavors, consisted of continuing store audits and consumer interviews.

New Product Shorts

Pepperidge Farm has added Tahiti Chocolate - Coconut and Butter - Nut crunch cookies to its Early American line.

William Underwood Co. will enter the fancy foods field with a line of canned meat, poultry, and fish items under a new Sir William label.

Valley Packing Service, Watsonville, Calif., is marketing frozen Sliced Apples under the Valley Frost label. After slicing, product is blanched and then frozen via a media of invert sugar solution.

SEA Brand Little Shrimp, reported to be the first frozen boil-in-bag product of any shrimp processor, is being introduced by Shoreline Enterprises of America, Inc., Tampa.

Nutrament, "a nutritionally complete meal in a 12½-oz. can that tastes like a milkshake," is on the market from Edward Dalton Co., the Metrecal developers.

Packaging Briefs

American Viscose Corp. has introduced two high yield cellophanes for food products. One, a nitro-cellulose coated film, is recommended for bread and baked goods. The other, polymer coated, is aimed at baked foods, chips, and snacks. (318)

Koppers Co.'s Plastics Div. has introduced a new polyethylene resin, Dylan 2037, for extrusion into a very clear glossy film by the blown tubing process. Film can be extruded at high speeds, is easily colored, and has printability as well as good heat-sealing properties. (319)

Lustran, a new generation of styrene-based plastics for molding and extrusion, with performance and physical properties ranging from paper to those of some metals, is now available from Monsanto Chemical Co. Features are rigidity, toughness and high tensile strength, as well as superior abrasion resistance, thermal stability, appearance, and ease of processing. (321)

Rubba-Foil, a heat-sealable adhesive for aluminum foil, has been developed by Rubba Inc., N. Y. C. (322)

Riegel

Creative Climate for Tomorrow's Packaging

...the new ideas come from **Riegel**

"Flavor fresh" inner packs . . . four sealed units containing three biscuits each . . . keep Nabisco Shredded Wheat oven-fresh and crumb-free. Just open them as you need them. For the best in protection . . . and sales appeal . . . Nabisco uses a special opaque cereal wrap by Riegel.

Whether you need the last word in protection and convenience . . or eye-catching sales appeal . . . or simply economy . . . Riegel can help. You'll be interested in the new, broader range of Riegel materials and services. Write today.

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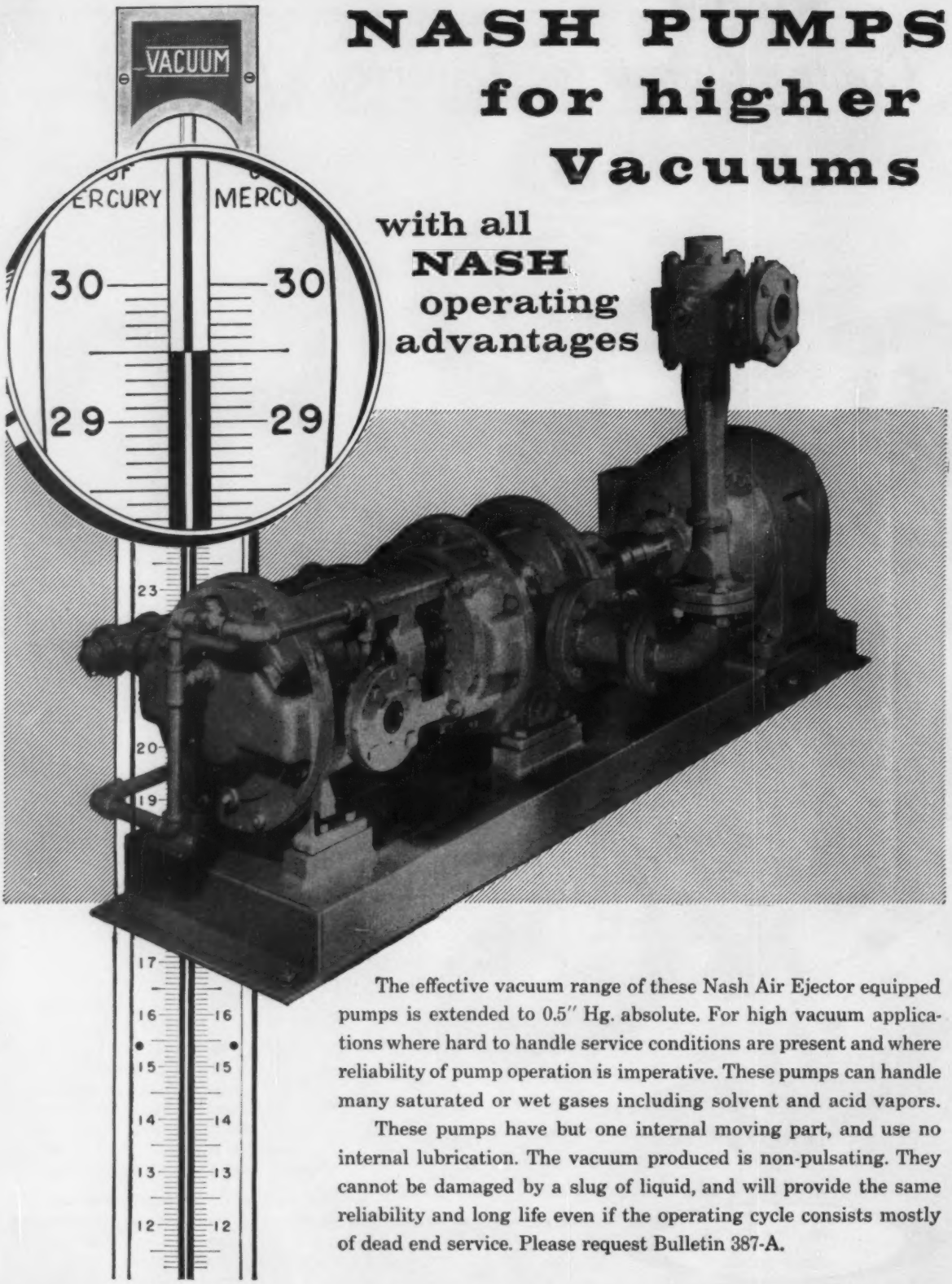
Specialist in the packaging of foods, drugs, and soft goods

Flexible packaging...carton board...folding cartons...carton liners

NASH PUMPS for higher Vacuums

with all **NASH** operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

Packaging Pointers

How to win buyers . . .

Package mate scores . . .

Pioneering pushed further

Easy Test for Oil-Grease Resistance

Simple method for checking oil- and greaseproofness of poly-coated paper was devised by Union Carbide Plastics. Technique uses very small amounts of colorless Rhodamine B Base in test materials (butter, lard, peanut oil).

If small red dot appears on the paper, it means there are weak spots in the coating. If paper turns a uniform red, it indicates an overall permeation of the plastic. Test also works for poly film, UCP reports.

Trade Convenience Helps New Product

Kraft Foods won buyer support for its new zip-open aluminum can for cheese dips by designing a shipping case that eases retailer handling. Each shipper holds 4 inner cartons of 6 cans each. This allow less-than-case quantity distribution from grocery warehouses to smaller stores.

Also, inner cartons have 2-in. circle cut-outs over each can to permit price-marking in the warehouse. Such pre-pricing, Kraft says, cuts down on pricing errors and shaves labor costs.

Suppliers' Services Grow

For years, can-makers have often located a manufacturing facility alongside the plant of a big food or beverage customer when volume justified it. Idea was to eliminate shipping costs, assure steady supply, and provide a superior service—all aimed at discouraging the customer from "rolling his own."

There are indications that, as the competition between different packaging materials grows fiercer, a broad range of suppliers may be forced to take the same step. R. C. Can Co., for example, recently put up a factory for making spiral-wound metal end containers alongside a Pillsbury facility that processes refrigerated biscuits. And Crown Zellerbach will build a plant for making fibreboard sheets and containers adjacent to a Sunkist affiliate, which will convert the sheets into shipping containers.

If Package Works, Try a Mate

So pleased is Morton Salt with the success of its tray-pack of individual salt shakers that it recently decided to find out if the same thing could be done with pepper. Store tests were staged whereby individual pepper shakers were placed beside the newly-designed salters.

Although no advertising was used, consumers picked up around 85 pepper shakers for every 100 salt packs. As a result, company will introduce 1½-oz. pepper shakers as a companion pack on a national scale this summer.

Aluminum's Plans for Food

Present decade will see aluminum packaging bringing big benefits to food packagers, predicts Kaiser Industries. Among the most promising developments, according to KI: Laminated foil canisters for citrus concentrates; wrap-around foil cans; special foil containers (with windows for controlled exposure of food) for cooking in electronic ovens; and tab-opening laminated cartons (baked goods) in which product can be heated and served from on the table.

Concentrator Expands Can-Making

Minute Maid, which rattled the can-makers last year when it decided to try fabricating its own cans, apparently finds the pioneering paying off. Frozen citrus packer installed a second line for assembling 6-oz. cans last month, lifting total capacity to 160 million units. **Franklin E. Penn, v.-p. prod., says the experiment has turned out "favorably," adds that the company "expects to achieve further economies by expanding the operation."**

Lithographed can parts, furnished by Reynolds Metals, can be assembled at a 425/min. rate, the supplier contends.

BRIEFS

Retailers complain that aluminum cans scar too easily when shipping cases of frozen orange juice are cut open, according to National Assn. of Retail Grocers.

Next year's National Packaging Exposition, sponsored by American Management Assn., takes place April 9-12 at New York City's Coliseum.

High barrier paper coating latex is now available in commercial quantities from Dewey & Almy. Company claims that paper and board coated with the new latex "have much higher moisture vapor resistance per unit weight than plastics now used for coatings."

Packaging Foundation, at Michigan State Univ., announced receipt of $25,000 grant from General Foods.

SHARPLES HELPS RANCHERS INNOVATE VEGETABLE OIL PROCESSING

The modern Ranchers Cotton Oil Refinery in Fresno, California is an innovation in Vegetable Oil Processing.

An article in the April issue of Food Processing magazine explains how the Sharples DG-2 Autojector—installed at the Ranchers refinery in mid-1960—eliminates one of the most laborious and critical manual operations of conventional processing—the filtration of cold oil to remove stearine crystals.

At Ranchers, Sharples Centrifugal Skill at Work helps turn out finished salad oil in 18 hours—one-fourth the time required by conventional processes.

The Sharples DG-2 centrifuge performs its processing operation in one continuous pass—without need for operator adjustment.

As a result the stearine's iodine value is substantially lowered—and the salad and cooking oil is of much higher quality.

Sharples is proud to have contributed to the success of this most modern of vegetable oil refineries.

We will be glad to show you how Sharples Centrifugal Skill at Work can streamline and improve your operation.

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Associated Companies and Representatives throughout the World

Let Us Turn Containerization to Our Purposes

Big improvements have been made in physical distribution. But high costs and arduous labor still are involved in loading and unloading railroad cars and trucks.

That's why containerization is so important, and why FE developed a special report on it (page 65). Here's a way to "pipeline" foods from manufacturer to wholesaler and large retailer, with tremendous reduction in handling and rehandling.

The same containers that accommodate big unit loads in shipping might be used to move ingredients through the factory, observes Frank Armour, president of H. J. Heinz. And containerized shipping may even be more significant in international trade than in the domestic market, he believes.

Consumers unload the pallets!

Particularly challenging is an opportunity pointed up by Gerald A. Fitzgerald, University of Massachusetts expert on food distribution. Several elements in the food industry are experimenting with pallet-load shipment to retailers of high-velocity items such as coffee.

A van containing eight or ten pallet loads can be delivered directly to as many stores, one pallet drop per store, Mr. Fitzgerald explains. This would bypass the warehouse entirely. What a saving in handling costs!

With fastest selling items, a pallet could be loaded in the factory and unloaded a can at a time by customers in a retail store—with no intermediate handling! Mr. Fitzgerald notes that the 32x40-in. floor space within a standard display rack can hold 40 cases of tomato soup, yet accommodate two sets of upper shelves to display other items in the same family of soups.

Even the retailer's back room is bypassed with this technique.

Several leading food manufacturers have nibbled at containerization, and they like the taste of efficiency. But they see problems ahead. Looming big is standardization.

Without standards, food companies, carriers, and leasing firms would have different containers of different sizes, shapes, and special features. This would seriously curtail the use and benefits of containerization.

Standards must suit food needs

American Standards Association has taken the all-important first step in standardization. It has set nominal lengths of 10, 20, 30, and 40 ft. for van containers. Still under consideration are exact sizes of cargo and pallet containers.

Next comes selection and "freezing" of special facilities, such as insulation, overhead rails, and side loading or no side loading.

FE is told that the food industry has not shown much interest in containerization standards. This situation must be arighted, and quickly. GMA has a committee that may do the job. In any event, leading manufacturers should make their needs known. Otherwise containerization will be standardized to suit other industries.

This opportunity is too big to muff!

HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

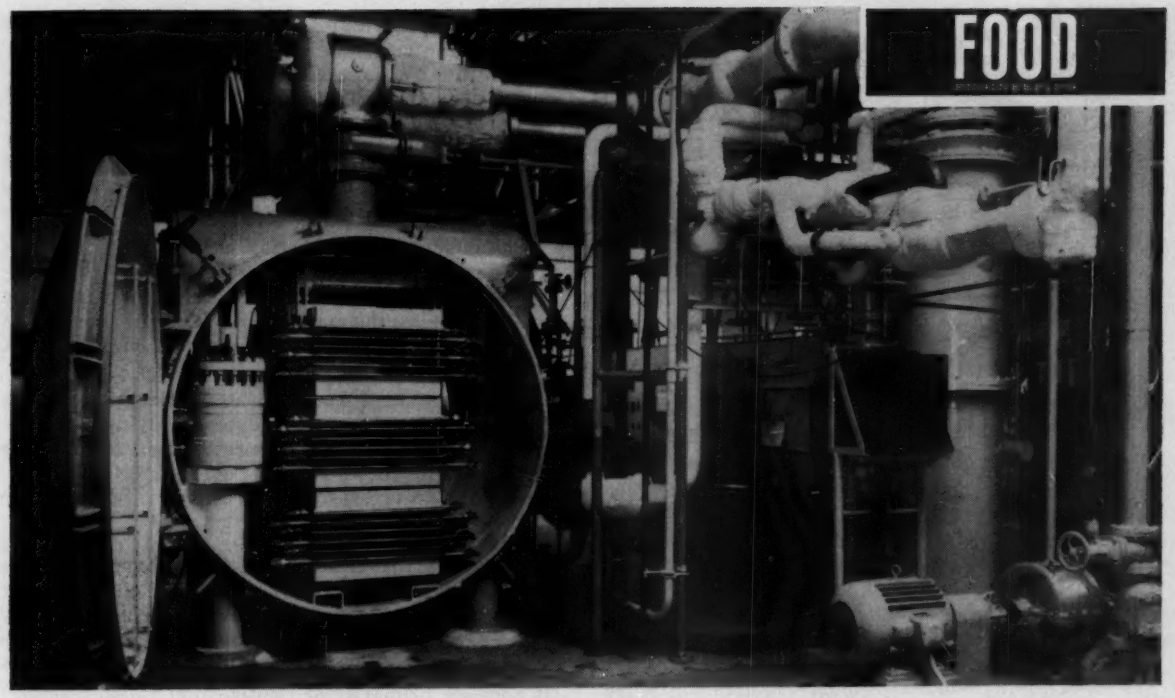
HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

The latest addition to Hercules' full life of HVP powder and liquids and MSG, HVP-Century offers many possibilities for cost savings and processing advantages.

A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

Be sure to visit us at the Baking Industry Exhibit BOOTH 958



EXPERIMENTAL FREEZE-DRYER installed by Armour & Co. at Aberdeen, Scotland, cuts processing time for 20-mm. thick products to about 6 hr. Heating plates, supported by individual bars, are moved by hydraulic cylinder. Spring supports between plates and bars compensate for any uneven product loading, thus prevent plate deformation.

Europeans Probe Accelerated Freeze-Drying

Faster drying commensurate with product quality is vital to economical production. Danish expert pinpoints variables, cites progress—including protective packaging

THERE'S LITTLE DOUBT that freeze-drying is a most promising food-preservation technique. For the manufacturer this new field opens up unlimited possibilities with respect to preparation of ready-to-cook dishes. But its widespread use still awaits lower-cost production.

Thus, today's emphasis is on mechanical design that can boost plant capacity for a given installation cost. Principal aims are more efficient vacuum plants and greater use of mechanical handling and conveying of materials.

In discussing latest European accelerated freeze-drying practice, we will review pertinent engineering factors, also the guarding of product quality through precautions in processing and protective packaging.

E. PETERSEN, Dr. Tech., A/S Atlas, Copenhagen, Denmark

Heat-Transfer Aspects

In high-vacuum drying, as distinct from air drying, there is no heat-transfer medium. Heating by convection is therefore negligible. Since dielectric heating is currently too expensive for practical use, only contact and radiation techniques remain.

To accelerate heating by contact, frozen material is dried between movable plates that exert adjustable pressure. This provides two-sided heating and maximum contact.

However, the importance of radiant heating for irregularly shaped foods should not be disre-

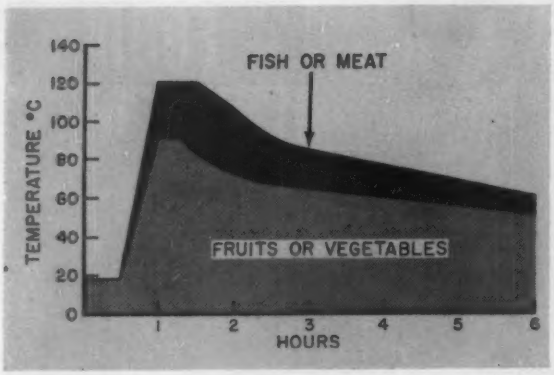


FIG. 1. OPTIMUM time-temperature schedules provide fastest drying rates that will not damage various products.

garded. Cauliflower, for example, provides relatively few contact points with heating plates. Considerable drying must then be due to radiation heating.

Consider a piece of frozen material placed between two heating plates in a high vacuum chamber:

Initially, ice crystals to be dried are present in the product surface. They absorb heat, sublime, and thereby cool the intermediate material. At this stage, relatively high temperatures can be used without damaging or scorching the material.

However, sufficient free space must be provided for escape of vapors, or pressure buildup causes partial melting. Free paths for vapor can be provided by inserting a netting between the metal surface and the material. A preferred type is the wire mesh of expanded metal developed by the British Ministry of Food Experimental Factory at Aberdeen.

When surface ice has disappeared, heat must be conducted into the material by conductivity or radiation. Initially, excessive temperatures in the already dried material are prevented by the cooling effect of the cold vapor stream from the interior. However, as the ice front moves further inward, this effect loses importance. Then the only way to prevent scorching is to adjust the temperature of the heating plates to values below critical.

The logical way of heating is to apply a temperature curve which, at any moment, attains the highest possible value without scorching or in other ways damaging the material. Such curves, applicable for freeze-drying of various types of products, are shown in Fig. 1.

The practice of keeping the heating plates at a relatively low temperature extends drying time unreasonably, without really protecting the products from damage.

Vacuum Equipment

Two basically different methods have been applied for obtaining the necessary vacuum—steam ejectors, and refrigerated vapor traps used in conjunction with mechanical pumps.

A typical steam-ejector system is shown in Fig. 2. It consists primarily of two parallel steam ejectors, one of which is rated for 2/3 duty, and the other for 1/3 duty. They compress vapors from 1-30 mm. (Hg), at which pressure vapors are condensed in a water-spray condenser.

The condenser, in turn, is evacuated by a system of three steam ejectors in series which compress the non-condensable gases from 30 mm. to atmospheric

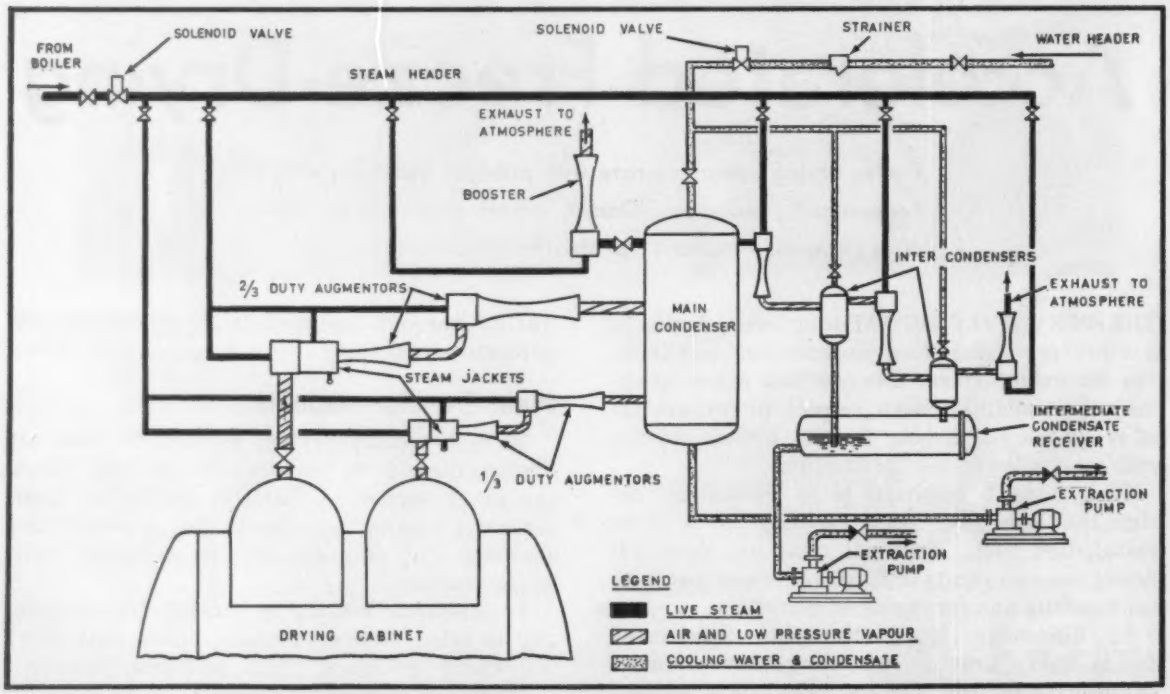


FIG. 2. PARALLEL STEAM-JET vacuum system minimizes steam and water consumption by alternate use of heavy- and light-duty ejectors after one hour's operation. Ejectors compress vapors, which then go to water-spray condenser. Latter is evacuated by three ejectors in series.

pressure. A booster ejector shortens the initial evacuation period.

Here is how the system works:

With the cabinet loaded and doors closed, all ejectors including the booster are started. When pressure has been brought down to 100 mm., which takes 2 min., the booster is cut off. Final vacuum of 1 mm. is reached in 2-3 min., then heating and evaporation start.

When, after about 1 hr., the evaporation rate has fallen sufficiently, the 1/3 duty ejector system is stopped and drying continues for about 2 hr. by the 2/3 duty ejector system. Then the 1/3 duty system is restarted, and the 2/3 duty system is disconnected for the rest of the drying period.

This method of operation achieves considerable economy in steam and water consumption.

A vacuum system consisting of a refrigerated vapor trap and mechanical pumps is shown by Fig. 3.

In operation, the mixture of vapor and non-condensable gases passes from the dryer to the vapor trap. Here, vapors are precipitated as ice on fin coils, which are internally cooled by direct expansion of ammonia at —35C.

Because ice formation is heaviest on the coils that first contact the vapor, special precautions must be taken to prevent closing the space between fins and coils. Otherwise, resistance to passage of vapor would be inconveniently increased.

But spacing the coils to avoid this phenomenon requires use of a bulky condenser. Since this increases the initial pumping volume, pumps must either be rated for a much higher capacity than required by the dryer, or evacuating time will be increased. Moreover, accumulation of sublimed ice on the coils decreases its heat-transfer coefficient, which also markedly influence the system's dimensions.

Reliable mechanical pumps are available, so the need is for major improvement in vapor-trap design.

Focus on Costs

In comparing installation costs of the two systems, one may tend to disregard the cost of the steam boiler for the ejector system. This makes steam ejection appear preferable to pumping.

However, many companies intending to freeze-dry already have the necessary refrigerating machinery, but not the boiler. In that case, the pumping system might be cheaper.

A steam-ejector system requires, per kg. of ice evaporated, about 10 kg. of steam, 800 kg. of cooling water, and 0.2 kw.-hr. of power. A pumping system with refrigerated vapor traps, requires some 150 kg. of cooling water and 0.9 kw.-hr. Availability of cooling water, will, therefore, often be a deciding factor in favor of the pumping system.

Advanced Drying Plant

Our lead illustration shows a freeze-drying plant with movable heating plates. It was installed by Armour & Co. in the British Ministry of Food Experimental Factory at Aberdeen. The plant was designed and manufactured by A/S ATLAS, Copenhagen.

The cabinet is of cylindrical shape, which ideally withstands outside air pressure. At either end, there are hinged doors with wheel-clamps which provide the initial seal. External air pressure, which provides sealing force of about 40 tons, and a specially designed vacuum seal ensure tightness during the high-vacuum period.

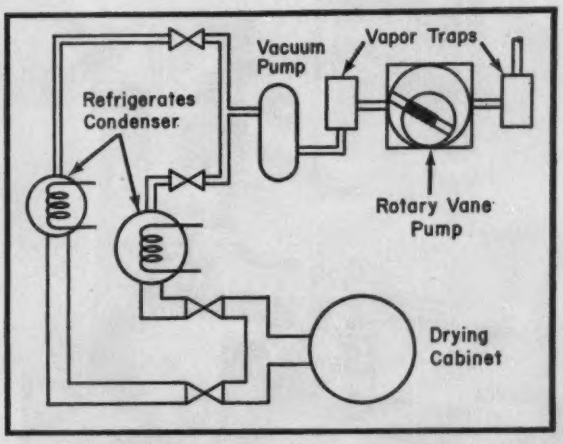


FIG. 3. REFRIGERATED vapor trap precipitates evacuated moisture as ice.

On top of the cabinet there are two compartments for levers, from which the heating plates are suspended by individual bars. Plates are moved by a hydraulic cylinder inside the cabinet. This system exerts pressures of up to 8 psi. on the product.

Because the total hydraulic system — cylinder, levers, and moving bars—is inside the cabinet, no shafts have to pass through the cabinet shell. This eliminates the risk of leaks after prolonged use.

Spring supports located between heating plates and moving bars compensate for uneveness in the layer of material to be dried without causing deformation of the plates. Patent application has been filed for this feature.

Many tests have been run in this cabinet on different varieties of meat, fish, vegetables, and fruits. And operating data for processing highly satisfactory products have been obtained.

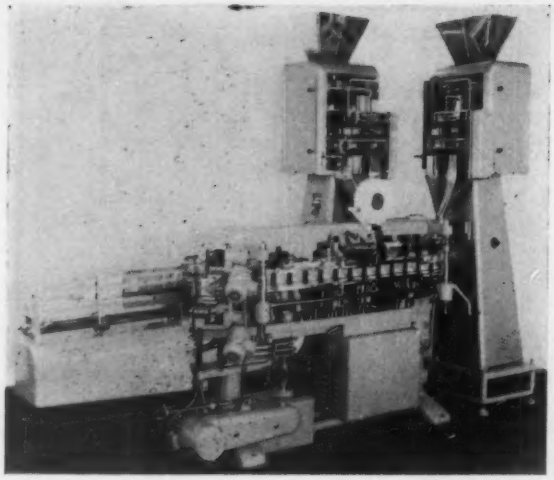
For example, vegetables can often be frozen by self-evaporation of 16-19% of their water content. However, such vacuum-freezing would cause case-hardening and discoloration of fish, meats, and a number of fruits.

With product thickness of 20 mm., drying time is about 6 hr.

Quality Factors

A 'truly' freeze-dried material can be considered a frozen product from which ice crystals have been removed without further changes. It would, on addition of water, act exactly as a frozen product that had been thawed. It doesn't matter whether water for rehydration originates from integral melted ice or from other sources.

(Turn page)



AUTOMATIC PACKAGER fills freeze-dried items into moisture-proof plastic bags. Latter are evacuated, flushed with nitrogen, and heat-sealed.

'True' freeze-drying would, however, demand that the materials' total water content be converted to ice before drying and remain so throughout the process. During freezing and subsequent dehydration, however, the gradually increasing concentration of water-soluble components produces eutectic mixtures. Some of them solidify below —30C. and tolerate considerable subcooling without crystallizing.

Obviously then, 'true' freeze-drying could hardly be performed on a commercial scale within practical cost limits. Thus, some compromise between ideal processing and production cost that results in an acceptable product is unavoidable.

Consumer acceptance of freeze-dried foods is the sum of many factors, the most important of which are:

1. Rehydration ratio. During freeze-drying, most proteins have a tendency to denature. As a result, rehydrated material appears tough and dry to the palate. As in freezing, this phenomenon is less pronounced the lower the temperature and the shorter process time.

For practical purposes, it has been found that fish can be successfully freeze-dried at 0.7-1.0 mm., which corresponds to a theoretical temperature at the ice front of —20 to —17C. Meat could be dehydrated at —15 to —10C.

Non-protein foods, such as vegetables, do not normally need these high vacua for successful drying. Fruits are often so high in water solubles, especially carbohydrates, that their eutectic mixtures have low melting points. This requires that product temperature be maintained below —17C. for successful dehydration.

2. Discoloration. This defect in the dry product has two main causes.

. . . First is surface crust formation, which indicates that temperature of the frozen material was too high during drying. This fault is often observed in fish and fruits.

. . . Second is browning due to excessive surface temperature of the already dried material. The only way to remedy this is to keep the temperature of the heat source sufficiently low to avoid excessive heating. Fortunately, most dried materials can stand relatively high temperatures without being damaged. Moreover, the cold vapor stream penetrating the porous material has a protective cooling effect on the latter.

Discoloration can occur during product storage if moisture content is not sufficiently low. This is due partly to the Maillard reaction and partly to oxidation. Traces of certain metals, like copper, also catalyze color development, thus must be avoided. And a bleaching or yellowing effect could be caused by light. Packaging must, therefore, provide suitable protection.

3. Off-flavor. Scorching during dehydration is the chief cause of off-flavor. It is avoided by careful use of proper temperature curves for the heat source.

Off-flavors that occur during storage are caused mostly by oxidation of fats or through processes accelerated by moisture absorption. This defect can be avoided by packing in moisture-proof material flushed with nitrogen.

4. Vitamin loss. Loss of vitamins and other known essential factors during freeze-drying is hardly measurable. During storage, however, moisture absorption would lead to serious losses, especially of Vitamin C. Its half-decomposition time is proportional to the square of the water content.

Points on Packaging

Freeze-dried products are very hygroscopic, therefore must be packed in moisture-proof material.

For example, a product moisture content of 1% reached at the end of drying could be raised to 1.8% just by breaking the vacuum in the cabinet with air of 70% R.H. And leaving products for 30 min. in such air could cause moisture content to increase to about 3%.

In addition to the previously cited deteriorating effects of oxygen and light, mechanical handling can easily disintegrate the brittle dry products. It has therefore become common practice to break vacuum in the cabinet by dry nitrogen gas, and to transfer products immediately to a room with relative humidity of not more than 30%.

Automatic or semi-automatic machines for packaging freeze-dried products have been developed in Sweden. One such machine is shown above.

Products are filled into moisture-proof plastic bags, then 80% of the bag opening is heat sealed. The bag is next evacuated and flushed with nitrogen twice, then sealed. A slight vacuum in the bag permits it to fold firmly around the product, which secures the latter in place. Plastic bags are packed in printed cartons, which also protect against light.

Thus processed and packaged, products will have several years of shelf life, also distinct advantages over frozen products in storage and handling. (End)

For an exhaustive review of freeze-drying trends and practices, both here and abroad, the reader is referred to the following FE features:

Freeze-Drying Makes New Production Strides—Nov. '60, p. 98.

Special Freeze-Drying Report—Dec. '60, p. 57.

Freeze-Drying: Where It Stands in Europe—Mar. '61, p. 31.

Point Up Freeze-Dry Phenomena—May '61, p. 57.

Armour Introduces Freeze-Dried Meals—June '61, p. 81.

FTC Readies Heftier Nightstick

FTC CHAIRMAN DIXON tells FE editor: "We must shorten the time between the day a complaint is filed with us and the day the final decision is made."

Stepped-up use of sweeping bans against "deceptive" or "unfair" acts, broad probes, and speedier decisions targeted by regulatory agency

A BIG FACTOR in your future planning will be the course set by the Federal Trade Commission, the industry's policeman-on-the-beat. FOOD Engineering's editors last month interviewed Chairman Paul Rand Dixon and other key Commission officials to get a picture of what's ahead for the food industry.

Briefly, here's what seems to be shaping up:

► **1) Basic shift in the long-range economic inquiry into food marketing. "Interpretations" and "recommendations" will get a bigger play.**

► **2) Educational efforts will be muted, while forceful prosecutions will be accelerated.**

► **3) Revival of little-used powers contained in Sections 5 and 6 of the FTC Act—the "sleeper" clauses.**

► **4) Closer coordination with other policing agencies, the White House, and Congress.**

► **5) Faster decisions—maybe.**

Of immediate concern to manufacturers is FTC's economic investigation. Strong Congressional criticism of the first reports, plus internal changes at the Commission, indicate that future phases of the probe will enrich statistics with "conclusions" and, possibly, legal recommendations. Senate Select Committee on Small Business recently complained that FTC did not focus "on alleged violations of law and tendencies to concentration of economic power, to collusive price action, and to unfair competitive methods, the reasons for which the inquiry was initiated."

Committee also faulted the questionnaire sent to canners and freezers for not having companies' operating statement "broken down to include, separately, sales and prices of private brands and national labels." And, it concluded, "the committee is at a loss to understand why FTC seems so reluctant to make recommendations."

It's a safe bet that future reports will be more to the committee's liking. For one thing, Quincy Adams, new head of FTC's Economics Bureau, leans to the view that recommendations should be part of the bureau's investigations. For another,

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

Dixon, who relied on economists when he was general counsel to Sen. Kefauver's antimonopoly subcommittee, strongly feels that the Bureau was downgraded the past several years and must be restored to an important level.

Not So Much Praying

A popular question industry execs ask is whether Dixon will continue the educational task set by his predecessor, Robert Kintner. Although the new chairman states that trade practice conferences and industry guides "can serve an educational purpose," he is quick to add qualifications. For example, he warns, "Voluntary compliance can be undertaken in good faith. It can also be used as a delaying tactic or as an escape hatch. We welcome bona fide self-policing, with emphasis on bona fide."

In the same vein, he doesn't buy the argument that Robinson-Patman and Clayton Acts are complicated laws beyond the comprehension of most businessmen. Thus, the R-P task force, set up by Kintner to spell out the law in simple language, has been scrapped. All this, plus Dixon's work with the Kefauver committee leads to the strong expectation that Dixon will place more reliance on active prosecution, less on prayerful pleas.

Dixon points out that the FTC chairman has a big say in directing the commission's "marksmanship and rate of fire." **And as he rolls up the heavy artillery that's available to the Commission, you can look forward to greater use of the sweeping provisions contained in Sections 5 and 6 of the FTC Act.**

For example, it's likely that FTC will step up the variety of industry-wide probes that are authorized by Sec. 6. Investigation-by-mail, contained in Sec. 6 (b), "is a good device," he says, "and more use should be made of it."

A second type, contained in Sec. 6 (c), permits FTC to make checks as to how defendants in antitrust actions have complied with decrees. Justice Dept. in a rare move, recently asked FTC to find out if defendants in 56 major antitrust cases have lived up to the judgments against them. FTC also plans a check on how its own cease-and-desist orders and consent decrees are being complied with.

A third sweeping type of investigation, authorized by Sec. 6 (a), permits FTC to launch industry-wide investigations of business conduct, practices, and management. It was this kind of exhaustive study that led to the consent decree barring major meat packers from diversifying their product lines. Significantly, it is the type of searching probe that is made to order for an upgraded Bureau of Economics.

Powder Keg on Tap

The new chairman feels that FTC should make greater use of the far-reaching bans contained in Sec. 5. That clause states broadly: "Unfair methods of competition in commerce, and unfair or deceptive acts or practices in commerce, are hereby declared unlawful." He reasons that Congress intentionally couched the ban in general language so that it would be up to the Commission to "apply the law in specific cases."

Further, he warns, "the weapons contained in Sec. 5 are sufficient if the Commission and the courts are as ingenious as the offenders. While the language may be broad, the Commission through its enforcement processes, is prepared to clarify doubtful areas.

An FE analysis of FTC complaints issued in calendar 1960

FTC's Chairman Paul Rand Dixon

Q. "Landis Report on Administrative Agencies" recommends that (1) FTC's anti-trust work (except for Robinson-Patman) be transferred to the Justice Dept., and (2) that FDA's activities be shifted to the FTC. What is your opinion of those suggestions?

A. Our jurisdiction is clearly spelled out by FTC Act, Wheeler-Lea amendment, Clayton Act, and Robinson-Patman. It is for Congress to decide whether any changes are necessary, just as it decided years ago that something broader than the Sherman Act was needed to curb unfair methods of competition. Because Wheeler-Lea Act bans false advertising of food products, we need to examine this area with FDA. Whereas we are concerned with what is said about a product, FDA is interested in what goes into the package and what is printed on the package.

Q. Why is FTC so determined to get access to the reports that companies file with the Census Bureau?

A. We have a right to them. To determine the 'probable effect' of a merger, you must make a thorough examination of all the competitive factors—market that is affected, share of market, geographic trading areas, the "universal" market—in their pre- and post-merger phases. Much proof is necessary, and is not readily available.

Q. Your predecessor, to help businessmen understand the Robinson-Patman Act, issued explanatory guides and named a "task force" to clarify the law in simple language. Do you intend to continue these techniques?

A. Our job is not to tell people how to do things. We will issue guides when a definite need is shown to exist. The law is not as complicated as some make it out to be. If the law is not right, then it is for Congress, not industry, to change it.

Gives Views on Key Issues • • •

Q. You have asked that FTC be given the right to issue temporary restraining orders against misleading ads. Wouldn't such power lead to a form of censorship?

A. Definitely not. We would still have to show the court, in each case, why the order was needed, and the opposing party would have the same opportunity to show why it may not be needed. Also, he would have the right of appeal. The important thing here is to stop false advertising while it is still claiming victims. Justice delayed is justice denied.

Q. What do you conceive to be FTC's basic job?

A. We're like the umpire who makes sure that all the players play fair, and penalizes those who break the rules. We're not for or against anyone, and it's ridiculous to think so.

Q. Considering your almost 20 years of experience with FTC, what staff changes do you have in mind?

A. To develop an organization that can move speedily and effectively. We need to serve business and consumers with a squad car instead of a horse and buggy. We hope to get more hearing examiners, cut down on unnecessary paperwork and reviews, tighten up hearing schedules so that they'll be carried straight through to a decision, and to centralize responsibility for a specific complaint in one man.

Q. How can food companies help FTC do its job?

A. Our competitive system won't work if businessmen don't believe in it. Unless industry helps us, we will have the law of the jungle, and our free enterprise system will be condemned in the eyes of the world.

shows 111 citations against food-beverage companies. Only 5 complaints were based on Sec. 5, while 113 referred to R-P violations. (The totals don't add up because the same complaint can charge violations of more than one statute.) It's more than likely that from now on Sec. 5 actions will represent a larger share of the total than they did last year.

One Sec. 5 target that Dixon intends to bear down on is deceptive advertising. In practically every talk he has made to date, the chairman has fired away at what he feels is the increased use of unfair advertising. As he told the Assn. of National Advertisers recently, "False advertising swings two clubs—one against the consumer, one against ethical competitors." Denying that the practice is limited to the "irresponsible few," he contends that "many an illegal decision is reached after being carefully weighed by companies and their ad agencies. They ask themselves: Can we get by with this claim? What are the chances of being stopped soon? Will increased sales justify the risk?"

Meshing the Gears

Along with broader investigations and stepped-up prosecutions, FTC is expected to move more in tune with the executive and legislative branches of government. A long-time toiler in Washington's vineyards, Dixon is a knowing practitioner of the governmetal arts. As with most dedicated men, he gives the impression of viewing government and politics as closely intertwined in their ends and means. **In a sense, it's the "New Frontier" version of the "leit motif" composed by the late Harry Hopkins. Only, the familiar lyric, "We'll tax and spend," has been updated to "We'll prosecute and investigate."**

Dixon appreciates the checks and balances of constitutional government that assure the independence of agencies such as FTC. At the same time, he views government as an integrated whole, with the different parts moving in step toward a common objective. Thus he candidly admits that FTC "will be alert to the policies and goals of other branches of government, most particularly the Congress and the President."

A particular objective of Dixon is to quicken the pace of FTC's processes to match the increased tempo of modern business. He hopes to bring this off with new weapons and reorganized manpower.

Among the added tools he seeks is the right to issue preliminary injunctions against contemplated mergers and unfair or deceptive advertising. "The period must be shortened between the time when an advertiser launches a questionable campaign," he insists, "and the time when the commission acts."

To see that this artillery is wielded more effectively, Dixon plans to reorganize FTC's manpower and decision-making processes. Bureaus will be restructured along topical areas—with one each for trade restraints (such as antimonopoly) and deceptive practices (false advertising). Hearings will be "compacted" for faster decisions. Thus, one man will get responsibility for developing and carrying out each case, and hearings will be continued until a decision is reached.

However, with only 14 hearing examiners at present, and a 3-yr. backlog of some 300-400 cases, this may be one of the hardest improvements to bring about.

(End)

creating the package

PLASTIC tray with built-in convenience ups firm's sales.

Boil-in-Plastic Tray Produces Premium Package

Midwest packer's high-density polyethylene tray and highly-engineered packaging line yield quality package with sales appeal. Housewife benefits, too

A MODERN PACKAGE and modern packaging methods help move your products fast—out of your plant and off the market shelves. That's why Terry Foods, Inc., Park Ridge, Ill., switched from a cellophane-overwrapped waxed paperboard carton to a "boil-in-tray" container for their frozen beef specialty items.

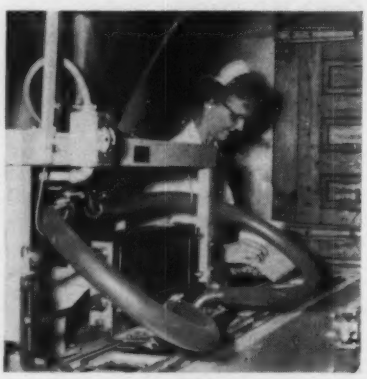
New tray, another plastic box breakthrough (FE Dec. '60, p. 68), is a development of Formed Container Corp., Orangeburg, N. Y., a subsidiary of Phillips Petroleum Co. Rectangular-shaped, opaque container is vacuum formed, with slightly tapered sides that are fluted to add strength and facilitate machine-dispensing on packaging lines. Its cover (lid) comprises 50-gauge, reverse-printed mylar that's extrusion coated with 1½ mil of polyethylene (to provide heat seal to tray). Extrusion-formed during trimming operation is a fork-lift on one of tray's top lips. This lift facilitates housewife's removal (with fork) of Marlex boil-in-tray from pan of boiling water.

Terry uses two different size trays for its three frozen beef specialties — barbecue sauce & sliced beef, gravy & sliced beef, and beef chop suey. One size (1¼ x4¼x5¼ in.) is for its 12-oz. pack, one tray inserted into a lock-type waxed carton. Another (2¼x4¼x 5¼ in.) is for its 20-oz. packs, two trays to a carton to form company's Twin-Pack. Waxed cartons (Marathon's Hi Fi Glamakote) are 4-color lithograph printed. Board is 0.014-in. gauge, with sides 1¼ x4-9/16x6 in. (for 12-oz. plastic trays), and 2¼x6x9⅛ in. (for 20-oz. trays).

Sure of new package's acceptance, Terry introduced it without undergoing any initial market testing. These boil-in-trays were distributed three months ago to chains, co-ops and independents throughout the midwest, south and east. Terry's president, T. A. Anderson, was so enthused over sales success of new package that he's expanding production — as fast as possible—from conventional cello-overwrapped carton. What's more, he's even expanding distribution to remaining untapped western states.

Just before the company adopted the new boil-in-tray, it had made arrangements to switch to limited market-tested mylar-polyethylene boil-in-bags. Decision to go immediately to the boil-in-tray was made after about half of the print job was completed on boil-in-bags.

Explaining why Terry switched to the new plastic trays, Anderson



TWIN-HEAD FILLER, mounted on reciprocating carriage, adds sauce or gravy to new plastic trays.

JOHN V. ZIEMBA
Senior Associate Editor, "Food Engineering"

points to these gains:

. . . **Tray's a premium-type quality food package** that's been quick to stimulate increased retailers' and consumers' acceptance for Terry's frozen ready-to-heat-and-eat specialties.

. . . **Lightweight containers** (10 g. for the 20-oz. size), nested 50,000 to a 4-ft. sq. pallet, weigh about half that of similar rigid foil containers.

. . . **Handling on packaging line** is easier, one of the main reasons Terry switched from boil-in-bag. Significant is the **ease in which product is filled** into new plastic tray. While overwrap machine is eliminated, a girl must now hand-pack trays into cartons.

. . . **New tray becomes its own attractive serving dish,** as with aluminum. Serving is easier than with boil-in-bags — one of the housewife's biggest gripes. Cooking time (in a pan of boiling water) is the same as for boil-in-bags.

. . . **Cost of new package** (plastic tray and waxed carton) is about the same as former cello-overwrapped carton. However, plastic tray runs about one-half less than foil container. And Anderson also figures a 33% savings over the boil-in-bag and carton combination package.

How New Line Operates

Biggest stumbling block in the development of new plastic tray was heat-sealing cover over its top opening. Trouble was that leakers sometimes developed when tray was water-boiled in housewife's cook pan. Formed Container licked with this specially designed tray and highly-engineered, synchronized packaging line. Tray's top horizontal lip protrudes about ½ in. from all four sides to provide maximum heat-sealing area. Packaging line, that operates at speed of 60 trays/min. with only two girls (formerly four girls with cello-overwrap-carton line), comprises 2-spout filler (Elgin), 3-head sealer and trimmer (Formed Container).

Here's how line operates:

. . . **Tray dispenser (which holds 300) deposits trays,** one at a time, onto 13-ft. twin-chain conveyor with spaced stainless steel tray-holders. Mounted on each holder is a silicone rubber heat-seal backup to provide necessary cushioning in subsequent heat-sealing operation. By preventing steel-to-steel contact, this composition rubber-type "gasket" assures positive heat-sealing of cover to open top of plastic tray.

ROLL-FED FILM is photo-eye registered (upper left) as it's cut to sheets that are accurately registered on filled trays. Trays are then side-sealed before 3-head walking-type sealer completes seal.

. . . **Trays previously filled with sliced meat** then continue to 2-head, piston-type volumetric filler mounted on a reciprocating carriage. As heads (with reciprocating slide valves) travel forward with two trays, filling valves remain open and deposit pre-set amount of gravy or sauce into containers. At end of forward travel, slide closes as it contacts a stop. Filling valves then remain closed as reciprocating carriage travels backward to pick up another pair of empty trays. Upon completing its return travel, slide valve strikes another stop to open filling valves. Cycle then repeats.

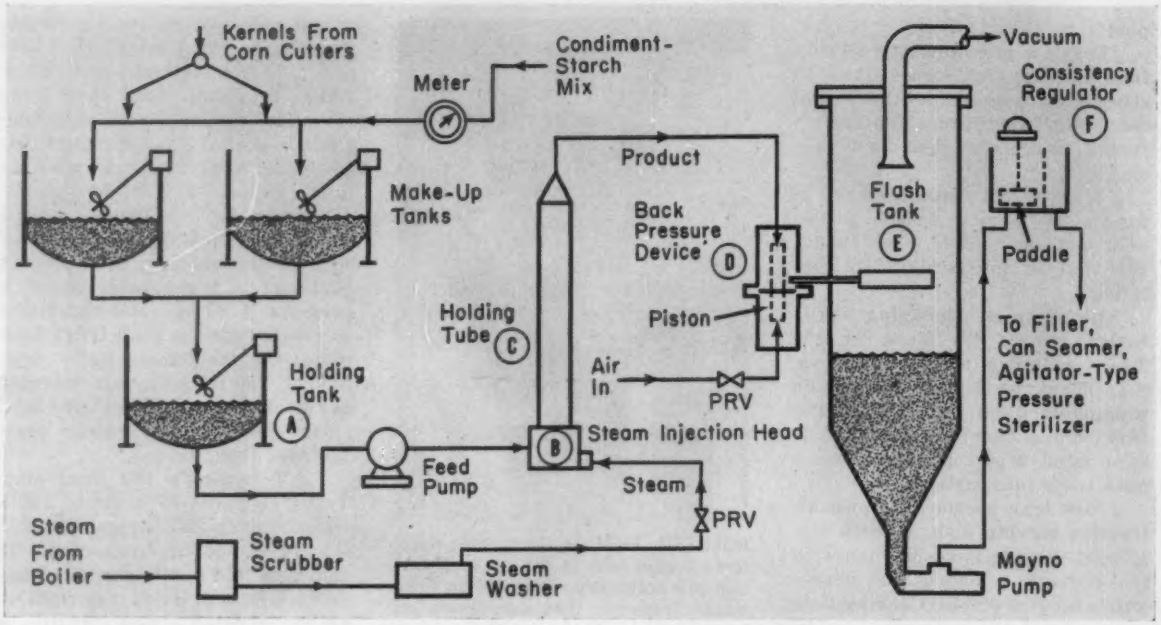
. . . **Cover sealing is next.** Here, roll-fed polyethylene-coated mylar passes a photoelectrically operated film-print register hooked up with a rotary cut-off knife. Cut sheet film is then transferred by a pair of 4-in. wide vertical traveling belts that increase velocity of each sheet. By speeding up travel of sheet, each is matched to pitch of forward moving filled tray. Constant velocity is maintained by spring tension, through mechanical linkage. This way, speed is trimmed to permit accurate registration of covering sheet over each tray—a step designed to prevent inaccurate sheet registration likely to result in leakers.

. . . **Registered film cover and tray** then pass under a pair of horizontal side sealers—two stainless steel bands (1-in. wide) that permit a thermostatically-controlled, 250-F. tack-seal. Tray then travels under spring-loaded, silicone-rubber coated tension rolls before proceeding to a reciprocating-type, 3-head walk-along sealer. Also mounted on heads of this platen-type heat-sealer is a silicone-rubber coating. Heat-sealer's pneumatically actuated, under a pressure of 80 psi., and cam-timed so heads (one for each tray) complete the thermostatically controlled 250-F. seal. Air-operated piston lowers (for sealing) and raises heads (to complete cycle for next three trays).

. . . **Trimming's the final step.** Trays continue to a chute (with short moving belt below) so that they're picked up by a chain-lug conveyor that singly deposits them into a trim die. Here, tray rests on an air-actuated piston elevator. A sensing device detects if tray is off- or on-center. If it's off-center, then pneumatically-operated piston press doesn't function. When properly centered, press makes contact with tray. Excess edges (cover and tray) are trimmed. At same time, tray's corners are rounded, as a 3/32x1¼-in. fork-lift insert is cut out of wide lip of tray. Piston elevator rises, and finished tray is transferred by lug chain to stainless chute feeding packing table, where trays are hand-inserted one or two to a waxed carton. Cycle repeats as another tray's fed to trim die.

Trimmer's also designed to notch a lip end of tray in event packer should go to a tear strip type of mylar-poly cover. (End)

TRIMMER centers trays, cuts excess off lip and film cover. Unit also cuts out (on lip) fork insert and rounds corners of tray.



IN NEW SYSTEM, 60F. product is pumped from holding tank (A) to steam-injection head (B) for flash-heating to 240F. It is held 30 sec. in holding tube (C) before proceeding to back-pressure device (D) and into flash tank (E) for vacuum cooling to below 195F. It then goes to consistency regulator (F), filler and agitator-type pressure cooker.

'Quick Cook' Betters Quality

Switch at Green Giant from batch precooking and sterilizing to modern flash heat-cool methods improves product and processing

FAST, CONTROLLED movement through a process, is the key to quality production. This often is a tough problem to solve, especially if it involves heat treating —like cooking a heat-sensitive product. But once solved, it yields other worthwhile benefits.

That's why Green Giant Co. (Le Sueur, Minn.) came up with a patented, speedier way of processing its new "quick cook" cream-style corn (white and golden kernels).

GG's speed demon is a Roto Jet cooker (FE, Mar. '58, p. 89) that works in conjunction with an HTST agitated method of sterilizing the "flash cooked" canned product. Patented phase of the process involves instantaneous steam-injection heating of the product (a cold corn kernel-condiment mix) to super-atmospheric temperature (240F.) and then flash evaporating (vacuum cooling) to below 195F., ready for agitated thermal sterilization.

New process has slashed GG's combined precooking (in Roto Jet) and thermal sterilizing time to less than one-quarter of that formerly required—from about 80-100 min. to less than 20 min. It used to take 15-30 min. to kettle-precook the kernel-condiment mix at 160-180F., and then 65-70 min. to thermal sterilize (in stationary retorts) the 195F., can-filled product at 250F. Now product is cooked by Roto Jet in 30 sec., then flash-cooled on its way to canning and a less-than-20-min. sterilizing—without product curdling—in an agitating-type pressure cooker.

GG's research vice-president G. C. Scott says this about the much improved cream-style corn: "Improvement in color and flavor is similar to that experienced when we switched from retort to continuous cooking of whole kernel corn over 10 years ago. New cream-style lacks the previously associated soupiness and pallid look. It retains more nutrients: 13% more vitamin A, 13% more vitamin C and 23% more vitamin B_2. In addition, the new process has given us other bonuses. It's improved working conditions and sanitation. The new equipment has abolished many of the extreme heat areas formerly associated in batching operations."

How It Got Started

Here's what happens when you prepare cream-style corn for longer periods: Undesirable product darkening, carmelization and browning (more noticeable with white kernel products) and destruction of heat-sensitive vitamins (niacin and thiamine). These were the shortcomings GG's man-

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Senior Associate Editor, "Food Engineering"

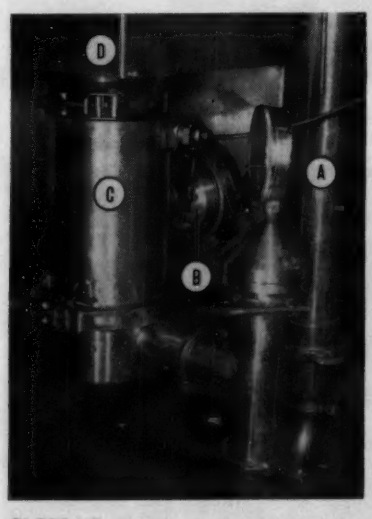
agement wanted its R & D department to overcome 10 yrs. ago.

The first step was directed toward improving cream-style's color and flavor—in a manner similar to that achieved with whole kernel corn. This was done by substituting continuous, high-speed, high-temperature cookers for conventional, stationary retorts. While continuous cooking did improve cream-style's color and flavor, it left an off-quality side-effect—curdling of cream component. Adding more starch or using different types of starches reduced curdling. But another troublesome side-effect remained —improper consistency. Even different methods of preparing the cream-style batch didn't work.

What proved successful was: Green Giant's patented method of reducing holding time prior to pre-cooking; pre-cooking to 240F. for ½ min.; and vacuum cooling before continuous pressure cooking.

Researching took ten years under Process Research headed by Jack Welch. Ellsworth Eue's Product Development section scaled up the 3-gpm. pilot plant process ten-fold to commercial size. John Martland's Ag Research and Seed Production Dept. contributed with its product-improving Code 20 and 22 seed.

Taking the process out of the pilot stage required the adoption of industry-available steam injection and flash vacuum cooling equipment. Selected were Roto Jet cookers fabricated by W. F. and John Barnes Co. (now handled by Amboy Sterile Packaging Co., Amboy, Ill.).



CLOSE-UP shows product-inlet pipe (A), steam-inlet pipe (B) and steam-injection head (C) with flash-heated product charged into housed holding tube (D).

HEART of Green Giant's new "quick-cook" method of making cream-style corn is this Roto Jet unit comprising injection head with its holding tube (both not shown), back-pressure device (A), flash tank (B) and panel board (C).

First trial-plant installation proved undersized. This was especially true with the flash tank whose diameter had to be sized up from 2 to 4½ ft. Suitable controls then had to be engineered into the new system before it could be mated with the continuous sterilization process. Meanwhile, a critical, carefully controlled thermal process (270F. for less than 20 min.) had to be established.

Once the process was put on stream at the Le Sueur cannery, installations followed in four other Green Giant plants.

How Systems Operate

► **Old system**—was not really old. In fact, fairly modern when compared with some batch cooking systems in use today. Green Giant used it to prepare cream-style corn only from golden kernels. The white kernel style couldn't meet the company's uniform, high-quality standards.

Former system usually consisted of two steam-heated, stainless steel batching tanks holding about 200 gal. and equipped with slowly revolving agitators. Into these kettles, measured amounts of washed, cleaned kernels were pumped from corn cutters along with a metered slurry of starch-condiment mix. While kettle was heated (160-180F.) for 5-10 min. and emptied, second was being charged. Batches were then gravity-discharged into any of three similarly constructed 600-gal. kettles. Here, batches were heated (direct-steam injection through perforated pipes) 25-30 min. at 160-180F. and slowly agitated. With the starch now gelatinized, batch was pumped through an on-stream consistency regulator to a holding tank for 180F. filling into 303 x 406 cans. Canned product was finally sterilized in stationary retorts for 70 min. at 250F. Capacity was intermittent, 50-60 gpm.

► **Today's system**—operates continuously at a 35-gpm. rate. Tank preparation of ingredients (kernels and condiment-starch slurry) is similar to old way except that there's no precooking and fewer tanks. Ingredients are alternately proportioned into agitator-equipped tanks (200 gal. each) and discharged cold (about 60F.) into a 400-gal. supply tank with agitator. Product is now continuously drawn from holding tank to variable-speed feed pump (Waukesha) and discharged to steam-injection head where it's brought up to 240F. Flash tank's sanitary float valve controls amount of product (35 gpm.) fed to Roto Jet. Float valve air adjusts feed pump's rpm. to balance input with output.

Steam-injection head, along with its holding tube (¼ x 8 ft.), is the heart of the Roto Jet unit. Injection head houses a stationary

flows) surrounded by steam-spreaded ring with tangentially drilled holes (1/16 in.). It's through these holes that boiler-generated steam (purified through scrubber and washer) is fanned out under a pressure of 80-100 psi., to assure uniform, intimate flash heating of turbulently agitated product that's held 30 sec. in holding tube.

Product is then piped to a back pressure device that prevents premature flashing with sudden collapse of steam bubbles and resultant noise and vibrations. Device comprises a pressure balancing piston within a stainless steel tubular sleeve. Premature product flashing is checked as top product pressure (10 psi.) and bottom air pressure (12 psi.) closely balance.

The 240F. product is then introduced into flash tank through a spreader plate. Tank operates under 7 in. (Hg) of vacuum to rapidly cool product to below 195F. Product then drops through a static leg, where a reverse-operating Moyno pump carries it to a consistency regulator (Dezurik). It then continues to 14-station filler operating at 360 cpm. Cans (8½ and 17 oz.) are sealed by a 6-spindle seamer and conveyed through FMC's continuous Steri-lmatic pressure cooker-cooler.

About 5% moisture (mostly that added by steam injection) is sucked out of the flash tank by a rotary-type vacuum pump and into the spray condenser. Spray condenser utilizes cold water, which removes condensable gases from product. Condensed moisture is drawn off by a condensate pump.

Why hook up the Moyno pump in reverse? So that there's pressure against pump's stuffing box to prevent loss of vacuum and pulling air into product. Otherwise, there's also chance of product darkening in slack-filled cans.

► **Automatic Controls**—panel board-mounted are:

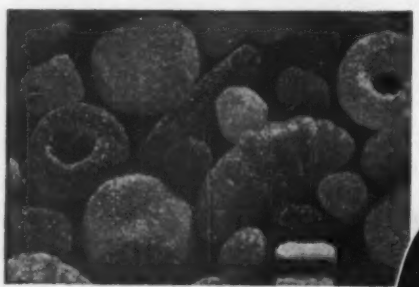
1. **Temperature recorder-controller for Roto Jet injection head,** with temperature-sensing element in injection head and controller operating pressure-regulating valve on steam line.

2. **Temperature recorder for product discharged from flash tank and tank-pressure controller.** Two-pen recorder is pre-set for 7 in. vacuum and 195F. product temperature. If vacuum, for example, goes above pre-set point, pressure controller opens vacuum-pump valve to reduce vacuum by admitting more air. And if temperature drops below 180F., feed pump stops and panel light flashes need for making correction. Correct filling temperature is the key to maintaining adequate vacuum in cans and thermal sterilizing process.

3. **Temperature recorder hooked up to bowl of filling machine.** Should recorded product temperature drop below 180F., pumps feeding injection head (the Waukesha) and filler bowl through consistency regulator (the Moyno) automatically stop as a warning light appears on panel board.

► **Other controls**—Consistency regulator consists of motor-driven, slowly-revolving paddles mounted on a vertical shaft and operating on the torque principle. If product is on the heavy consistency side, either a solenoid valve (air operated) or electrical switch actuates a motor driven valve to admit required amount of correcting water.

Consistency regulator's overflow tank is equipped with an air-operated float-control valve that operates speed controller on Waukesha and Moyno pumps. Controller slows and then stops pumps. (End)



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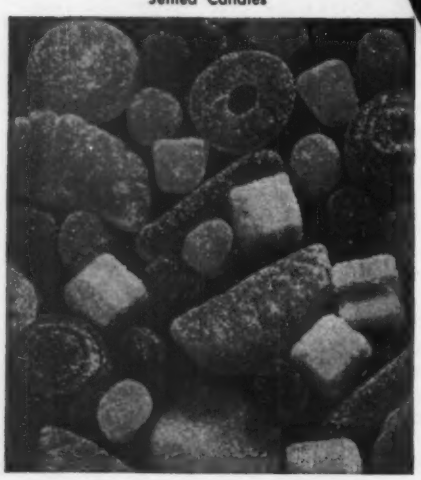

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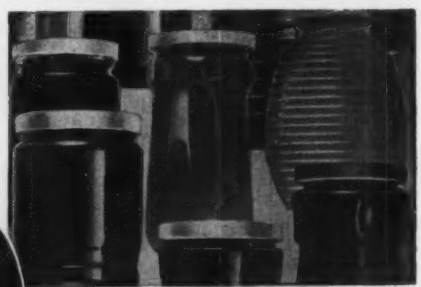

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Bouquets for Brewery Workers

In a survey by Rep. Elmer J. Holland (D-Pa.), Brewery Workers union complained that industry employment decreased 25% from '50 to '60. Problem's tough, but workers themselves are seeking solutions.

Jacob Ruppert, NYC, asked for elimination of 48 jobs and a 10% paycut following a $2.5 million deficit in '60. But a Brewery Workers Joint Board, representing three Teamster locals, successfully offered an alternate plan designed to reduce labor costs by $700,000 per year.

Under the plan, some 800 union members take a 5-week layoff on a rotating basis and some 60 workers receive special inducements to retire early. Other craft and clerical unions were expected to accept similar proposals, and management officials were to take a minimum 10% salary cut.

In Wilkes-Barre, Pa., the Brewery Workers local voted to raise $21,000 to create new jobs for area citizens who, union hopes, will drink more beer. Some $19,500 will come via 25¢/wk. contributions from 500 union members; the balance from union's treasury.

Plan for Automation Transition

If operational changes are on the horizon, take a tip from General Foods. When it's recognized that changes could result in permanent lay-offs, G.F.'s v.-p. J. B. Holbrook points to three rules managers follow to help soften the impact:

► Planning and development of such changes must be accompanied by equal study and planning for solution of related personnel problems that may arise.

► As soon as possible and practicable, facts related to expected changes affecting employees are communicated to them and, where applicable, to union representatives.

► Workable placement and training procedures are reviewed to provide opportunity for employees to maintain employment within the plant or prepare for jobs elsewhere in the community.

Is Your Benefits Cost in Line?

Preliminary data on Supplementary Remuneration Practices for Production Workers in '59 (USDL) can provide a worthwhile benchmark for judging your employee benefit costs.

That year, paid leave in food and kindred products industry totaled 6% of gross payroll costs; premium pay 4.2%; legally required payments 4.7%; and private welfare plans 5.2%. As cents/hr., costs were 12.6, 8.9, 10.0, and 10.8, respectively.

Job Evaluation Proves Its Worth

Job evaluation programs to measure wage relationships have finally "arrived." At least that's the consensus of a 500-company survey conducted by George Fry & Assoc. which showed that 97% would install a program if they had to do it again.

In 34% of the companies, unions helped pick the plans and 11% were actually union-requested. Union representation on evaluation committees more often helped make the program "highly successful."

Tips to Management

Brewery workers bend . . . Industry's employee benefits cost . . . BCW cleans house

Cross Crossed Off by BCW

Following the forced resignation of former Bakery & Confectionery Workers Pres. J. G. Cross, a return to the AFL-CIO by the previously expelled union seems likely.

Cross, long-time target of corruption charges, had been under suspension along with his secretary-treasurer. He submitted his resignation one day in advance of a scheduled union trial on charges of mishandling $35,000 of dues money. He will also return a $60,000 West Palm Beach home which had been partly financed by the union. But defunct official did manage to extract a monthly pension from the union in return for his resignation.

Present union officials escaped internal charges of trying to conceal use of the $35,000 when a federal judge refused to strip their power because measure was "too drastic."

BRIEFS

Labor press devotes over one-fifth of its space to economic education, whereas company publications are virtually silent on this subject, according to an N.Y.U. professor.

An "Invitation" to food firms to meet the '61 graduating food technologists of Oregon State College is provided via a brochure describing graduates' background and experience. It's available from OSU's Dept. of Food & Dairy Technology, Corvallis.

Food and kindred products industry received largest number of loans (1,103) granted by Small Business Administration to manufacturing industries. Cumulative through June '60, food received $90,520,000.

Scholarships totaling $78,000 have been established at Columbia University's Institute of Nutrition Sciences for students of underdeveloped nations to study nutrition and food technology. Sponsors are Heinz, Borden, Corn Products, Campbell, General Foods, General Mills, and Pillsbury.

Libby's work simplification program
benefits company, employees and customers.
Costs are reduced, too, as . . .

Employees Team Up for Improved Job Efficiency

MAJOR GOAL of work simplification at Libby, McNeill & Libby is threefold—to work easier, better, and smoother.

Work simplification is the organized use of common sense to develop easier and preferred ways of doing a job. It encourages people to work smarter, not harder. In short, it's a technique that taps our greatest resource—the brainpower and experience of people on the job.

As a grass-roots activity early in '58, we took the first steps in creating what we now feel is a first-class work simplication program. Within this period, Libby trained 963 employees and expects to double this number within the next two years.

During the first two years of training, involving 963 employees, savings from better and easier ways of performing operations were substantial. And over just the last 18-mo. period, we have made 395 work simplification improvements.

Here are a few specific results:

► **Chicago's 25-man team** blueprinted the entire production layout of a new $10-million canned meat plant. Minutes and, in some instances, hours were shaved from present methods. Scores of jobs were made easier and safer. Costly re-arranging operations were reduced.

NEFF GRAHAM
Industrial Engineer,
Libby, McNeill & Libby, Chicago

► **At Sacramento,** a mass assault by work simplification teams resulted in more than 50 operational improvements.

► **At Gridley,** operational changes in the inspection of peaches for split pits saved hundreds of man hours (freeing some employees for other jobs) and assured more uniform control over product quality.

► **Eastern division plants** achieved greater production efficiency by re-arranging catsup labeling, using hydraulic dump wagons for corn picking, and changing loading operations.

► **In Hawaii,** improvements appeared in packing pineapple chunks and field spraying. In some instances, highly efficient methods have been replaced by even better ones.

► **In the general superintendent's department (Chicago),** a simple change in handling local expenditures achieved substantial savings through elimination of correspondence and paper work.

$ $ Savings, Too

Program is also paying off in substantial dollars and cents savings.

Cost reduction, however, is not work simplification's prime objective, although, as pointed out, economics invariably begin to pop up all over when the program goes into effect. It's a way to discover how jobs can be made easier and more effective, as well as how facilities and equipment can be used to better advantage. It often adds up to a savings in human energy rather than in dollars and cents. But we'll take those dollars and cents wherever they occur, for they keep the company competitive and help all employees protect their jobs.

Work simplification has made many jobs safer and improved working conditions. Some have improved services to our customers, speeded up shipments, and reduced paperwork. Others have helped improve products through better quality control procedures and processing methods.

In gearing up for a work simplification job, we follow these five simple rules:

1. **Pick a job for improvement**—Usually it's one that's giving trouble. It might be a production bottleneck, a safety hazard or, perhaps, an operation that puts too much strain on employees.

2. **Get the facts**—Take the job apart listing and analyzing every operation. The team members should always include those who are actually performing the job.

3. **Challenge every detail of the job**—Evaluate each step, and ask these questions: "Can this step be eliminated? If not, can it be simplified?"

4. **Put the details of the job back together again**—Leave out everything that's unnecessary and develop superior methods for performing the remaining operations.

5. **Adopt the superior method.**

We promote the feeling among

WASTED MOTION (indicated by wrist-light rays) caused considerable fatigue in this case-packing operation until . . .

. . . **SIMPLIFICATION TEAM** devised a handling technique requiring only a minimum of motion and providing smoother performance.

our employees that participating in work simplification is a stimulating experience. Team members find that it's actually fun to figure out a new way to do their jobs—to look at an old problem in a new light. Once they have mastered the simple skills involved in approaching a problem scientifically, our people are often amazed at how easy it is to discover a more effective way to do their jobs. We show them that work simplication is a way to getting them to put their own ideas into practice.

To organize thinking along work simplification lines, our people are trained in the use of the basic tools of analysis — flow process charts, flow diagrams, multiple activity, etc. Actually, training employees how to use these tools for methods analysis is one of the first steps in work simplification.

Chain of Command

Libby moved quickly to put its work simplification activities into effect. A top level steering committee was formed, reporting directly to Pres. C. S. Bridges. The membership includes v.-ps., A. J. Hoefer and K. C. Hardwicke; F. E. Williams, general superintendent of Eastern Division; J. D. Kelly, Chicago plant manager; L. B. Duggan, International Div.; and Neff W. Graham, manager of industrial engineering, who serves as secretary and coordinator. Mr. Graham and others on committee serve as "consultants" when divisional managers, coordinators, etc., ask for advice and guidance.

Committee's first task was to establish broad policies of procedure and keep top executives informed of activity progress. Next step was to make sure that the company was getting the greatest possible benefits. Week by week it reviewed the over-all progress of work simplification activities, evaluated their effectiveness, and clarified policies with respect to long-range aspects.

Work simplification tools and techniques are those of the industrial engineer, whose leadership is oriented toward a cooperative effort—at all levels—to implement improvements. He employs his leadership and technical know-how to spark the action of others.

Divisional activities are coordinated by special staff men who are charged with training and overall direction of work simplification. These men have had special training at work simplification conferences. Each reports directly to divisional management through a divisional steering committee.

At plant level, project teams are guided and assisted by a coordinator or a plant steering committee. These teams usually consist of three, four, or five members. Their make-up depends on the nature of the problem under study. Teams make a plant-wide assault on knotty problems and seek out answers that lead to improvements.

Methods, for example, that were installed just a few years ago are now undergoing wholesale changes. No matter how well a method has performed in the past, Libby feels it can be improved. Groups of employees formed into teams are the real basis for the success of work simplification.

The philosophies taught and practiced in our work simplification have improved the morale and attitude of participating employees by making them part of the team and by helping them to better themselves and the company.

Four Key Phases

Program activities are broken into four key phases:

Phase I-Application. Before starting the work simplification activity, appreciation sessions are held with top management. During this phase, the management group is given a resume of what work simplification is and how it works.

Later sessions of two or three day duration are conducted for other management groups, after which the management group decides whether or not to request the activity.

Phase II-Educational. Training material, which has been developed by work simplification coordinators (graduates of the Lake Placid Work Simplification Con-

ference), is first presented to a pilot group of top management personnel.

After the program has gained the acceptance of the pilot group, coordinators present the training material to personnel at our plants and offices. The conference method of presentation is used and all participants are urged to participate to the fullest extent.

This educational phase has been erroneously considered by some as the only phase and thus has been used as training alone. We decided at the very start that work simplification would not revert to just another training program and we have developed follow-up machinery to assure a transition from the educational to the application phase.

Phase III-Application. This is the pay-off phase where what is learned during training is put to practical use. Organized and continuous use of common sense tools and techniques is made in order to develop and apply improvements at every level of the organization in all activities. It is done through selected project teams within a policy framework created from within to fit the organization and circumstances involved.

Phase IV-Feedback. Progress project reports (to include project team members) are circulated throughout the company so other units can learn about the completed projects. By studying each, others can employ them to stimulate the development of still better methods. Summary reports keep interest in a wide variety of developments at a high pitch among various plants and branches. Of equal importance is top level awareness and recognition of results.

Awards Spur Projects

Our employees feel it's fun to participate in group work simplication activities. Given the chance, people naturally want to improve and this desire has given our employees a new sense of importance. It's made them more effective in presenting ideas.

Simplification works side-by-side with our suggestion plan. Awards are given for ideas initiating projects.

In addition, we have developed a work simplification contest involving all of our plants. An "Oscar" for achievement is presented to the winning plant and the winning office at the end of each fiscal year. A point system is used, weighted according to the number of trained and active personnel in each plant and the number of improvements submitted and installed. Projects are also dollar-valued and individual improvements are often worth thousands of dollars.

In evaluating work simplification, our Sacramento plant management has this to say:

"It's educating our people to look for better methods that will lead to better employee relations. We are getting greater cooperation from our people, and they are beginning to get a better understanding of our problems. We believe it stimulates greater individual interest in the company. The door is always open to employees for presenting their problems to top level management through work simplification proposals.

"Management, in turn, approves projects costing large sums of money when it is clear that such projects improve our operations. It is hard to overestimate the pride in accomplishment of individual employees who have won management approval of a project. As a morale builder, work simplification has few equals."

Although Libby has had immediate and sometimes dramatic success with work simplification wherever it has been tried, it is not meant to be a shot-in-the-arm solution to a problem. Flash ideas may be good, but they are often incomplete. They rarely take into account how the change will affect other employees and operations.

Work simplification, it should be emphasized, is an over-all, long-term plan of steady improvement. It requires training in work simplification techniques and the scientific application of ideas. (End)

APPRECIATION SESSION, conducted by author Neff Graham (standing), acquaints key personnel at Ocala, Fla., plant with techniques and benefits of work simplification.

CIRCLE 49 ON INQUIRY CARD ➔

Tri-Clover Flow Control
goes to work at **Sexton** *Foods*

FESCO AIR-ACTUATED VALVES

automatically control preserve operation

Serving as silent sentinels over a preserve processing and filling operation at the Indianapolis, Indiana plant of Sexton Foods, Fesco valves have helped to fulfill the requirements which this quality-conscious food processor sought during recent modernization:

Quality first. Positive, fast acting Fesco valves help eliminate guesswork . . . promote accurate quality control and inventory records.

Process more product. Automatic valves permit maximum and continuous use of processing equipment and promote use of scientifically controlled processing techniques.

Like many progressive processors, Sexton specified, and *got*, direct, positive and automatic control over product flow—with Fesco Air-Actuated Valves.

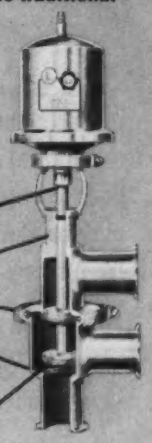
A 36-page *Flow Control Handbook* is available to show you how the combined facilities of Tri-Clover and Fesco Divisions can put air-actuated valves to work on *your* specific corrosion, cleaning or flow control problems.

Write for Catalog F60.

At the Sexton Foods plant in Indianapolis, Fesco valves, monitored from remote panel, automatically control flow of preserves to and from cooking and filling operations. Holding kettles (above) feed filler hoppers.

S-451

Here's why trouble-free operation is traditional with Fesco Valves:



No tools required to separate stainless steel actuator from stem.

Yoke-bonnet shows stem position and provides leak detection.

Precision molded bonnet gasket bonded to stainless steel spacer for perfect valve alignment.

Valve stem is hard chrome plated to eliminate galling.

The valve bonnet bore is burnished to prolong life of "O" Ring seals.

"V" type clamp insures positive body connection.

Port is flush with valve seat for complete draining of product or cleaning solution.

Molded inert synthetic valve stem seat assures long service.

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Keep your product in her cart ...week after week

Corn starches and syrups are time-tested, nourishing, economical carbohydrates. They've long been used and accepted as foods and food ingredients. They may be the answer to problems you have resulting from recent legislation regarding foods because:

In addition to being time-tested, nourishing, economical carbohydrates, corn starches and syrups can provide valuable functional properties as:

• Stabilizers • Emulsifiers • Binders • Humectants • Bland sweeteners • Texturizers • Preservatives (of natural body and color) • Thickeners (for consistency control) • Sugar Crystalization control • Coatings—Glazes

CORN STARCH is ideal for baking, baking powder, meats, mustard, salad dressing, custards, pudding, canned soups, etc.

CORN SYRUPS are used in mixed syrups, infant foods, preserves, jams, jellies, baked beans, sausage and cured meats, frozen and canned fruits, frozen deserts and many other products.

CORN SYRUP SOLIDS are widely used in ice cream, baked goods, frozen fruits, dry food mixes, jams, jellies, table ready and canned meats, to mention just a few.

Whatever you may be processing OK BRAND corn syrups or starches will help you keep your product in her cart week after week.

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You can depend on HUBINGER... *fast shipment by rail... prompt delivery by truck*

TURKEY WAREHOUSE represents largest installation of urethane foam insulation. Here foam is applied between precast urethane studding.

FOOD TRUCKS, trailers and RR cars are advantageously insulated by foam-in-place methods to form solid cocoon heat barrier.

Freon-Blown Urethane Foams Solve Insulation Problems

Installed three ways, these foams are twice as effective as cork. Also have strength, keep moisture out, and aid sanitation

THEY DO NOT depend upon entrapped air for their performance. Instead, foamed urethaned insulations imprison Freon in their rigid cells. The gas has a K factor of 0.12. This is less than half the thermal conductivity of air, which determines the effectiveness of other insulations (Table I).

With a density of only 2 lb./cu. ft., urethane foams have a compression strength of 40 psi. and tensile strength of 50 to 60 psi. More than 90% of the cells are closed, making both water absorption and vapor permeability extremely low.

Biggest Installation

Largest urethane foam installation to date is in the refrigerated warehouse of the Turkey Growers Coop. of Central California. Located at Selma, the warehouse is in one of the state's hottest regions.

Fiberglas Engineering and Supply Co. poured continuously a 150x100-ft. floor, 5 in. thick. Then it insulated the 30-ft. high walls and ceiling by pouring 12-in. increments 4½ in. thick between precast rigid urethane foam studs on 16-in. centers. Outer walls were of concrete block, inner surface of cement asbestos board. The result was a monolithic "cocoon" of high performance insulation encasing the entire structure.

One of the greatest causes of warehouse failure — vapor penetration between the insulation and the wall — was eliminated. Strength was added to the structure by the foam, and maintenance is expected to be less.

Three Ways To Install

There are three ways to install urethane foam as an insulating medium: (1) Cementing cut slabs or planks in place. (2) Pouring the liquid foam mixture into the cavity and foaming in place. (3) Spraying to build up required thickness.

Cut slabs of urethane foam may be used for insulating trucks and trailers—as they have been for cold storage rooms, shipping containers, and the like. In complicated installations like refrigerated truck trailers, however, performance depends to considerable extent on the thoroughness and skill of the man doing the work.

Foaming-in-place, the second method, is unique to urethane foams. In this process, two liquids are mixed in carefully measured proportions and poured into the cavity to be filled. One liquid is the product of the reaction of a resin with toluene diisocyanate — such as du Pont's "Hylene" organic isocyanate. The second is another portion of resin along with a

TABLE I. K Factor—Commercial Insulation Materials

Material	K Factor @75°F.
Cork	.28
Glass foam	.40
Polystyrene foam	.26
Glass fiber	.23
Rock wool	.32
Urethane foam blown with Freon	.11-.12

RALPH F. HARRIS, Elastomers Laboratory, E. I. du Pont de Nemours & Co., Wilmington, Del.

Freon blowing agent and catalysts. Within 30 sec. of pouring, the materials begin to react, generating heat. As the blowing agent begins to boil, the resultant bubbles expand the mass to a volume predetermined by the amount of materials used. After expansion is complete, further chemical reaction completes the hardening of the urethane polymer.

Both component liquids are viscous, with a consistency comparable to maple syrup or honey. It is important that they be mixed thoroughly and in exact proportions because they must react completely with each other to form high quality urethane foam. Although they can be weighed out manually and mixed in batches by hand stirring, this method is practical only on a small scale.

Automatic metering and mixing machines should be used to form large, relatively thick sections such as trailer walls. Such automatic equipment is readily available commercially. But, practicality and economics indicate that most food concerns would find it desirable to have urethane foam insulation installed by their truck, trailer, and equipment suppliers, by commercial refrigeration suppliers, or by custom foam installers.

In addition to mixing and metering requirements, temperature control is important to ultimate properties of the foam. Proper provision must be made for ventilation during foaming, because the vapors given off, while not toxic, can irritate mucous membranes, particularly in individuals with any history of asthma.

An additional complication is pressure build-up as the foam rises, particularly noticeable in thin sections. Experienced operators have overcome this problem with existing foaming compositions, and research is developing improved technology. One of the innovations under way is prefrothing to cut down on amount of expansion necessary to fill a given volume completely.

Spray application of foam—the third method — is now a going, commercial process. Skill in application is required, and ventilation requirements in interior applications are considerable. It is applied ordinarily in thicknesses of ½ to 2 in. Most applications have been on tanks, pipes, and other processing equipment, and on building walls and roofs.

TABLE II. Typical Physical Properties of Rigid Urethane Foams Blown with Freon

Density, lb./cu. ft.	2.1
K Factor, Btu./(hr.) (sq. ft.) (F/in.)	0.11
Closed cells, %	91
Moisture-vapor transmission, perms	5
Tensile strength, psi.	48
Compression strength, psi.:	
10% deflection	38
30% deflection	39
Yield point	41
Shrinkage	Nil

For the majority of installations in the food field, the foam-in-place method offers the greatest advantages. With proper equipment and trained personnel, it is convenient to install. It adheres firmly to cavity walls, with no settling in use. And, it eliminates cavities in which condensed moisture can collect and deteriorate wood or metal. Even in the rigid foams, there is sufficient elasticity to "work" with the motion of transportation equipment so that the insulating shell does not crack or crumble. As it foams, a skin forms on the surface which minimizes any water or vapor transmission, as does the predominantly closed cell structure. And, paramount for insulation, it enjoys lasting low-heat transmission characteristics.

Transportation Achievements

An example of high performance resulted from an extensive test of a refrigerator car developed for the Burlington Refrigerator Express Co. A major feature of the car was complete urethane foam insulation bonding together roof, sides, ends, and floor. A special refrigeration unit directly driven by a diesel engine, refrigerates, heats, and defrosts the car.

With conventional insulation, as the vapor barrier deteriorates, moisture enters the insulation and can soon mount up to 1,000 lb. of entrapped liquid. Since there is an increase of 5% in conductivity for each 1% gain in weight due to moisture, excess refrigeration capacity is ordinarily provided. There normally is 50% excess in new cars.

In addition, entrapped moisture rots insulation and wooden parts and corrodes metal parts of the car structure. It also builds up objectionable odors.

Foamed-in-place urethane eliminated those problems, and sanitation was markedly improved.

At 100 deg. temperature differential, heat leakage from the 34-ft. long interior was only 8,344 Btu./hr., roughly one-third better than the normal heat loss of 11,000 Btu./hr. for conventionally insulated cars.

After 18 months of testing and commercial operation, the new refrigeration system has been appraised by H. R. Hudgens, Jr., Burlington's general perishable freight agent. He says that it promises to "eliminate the major problems now encountered with insulated refrigerator cars."

In truck trailers, equally dramatic progress has been made. Reducing the "cocoon" installation of urethane foam to an assembly line operation, Brown Trailer Division of Clark Equipment Co. produced more than 100 such reefers last year.

For utmost efficiency, trailer construction is designed with the foaming operation in mind. Side and end walls open into both floor and roof cavities so that insulation in all areas is bonded together when the job is complete.

Using a formulation made with "Hylene" organic isocyanates and Freon blowing agent, Brown attains a lasting K factor of 0.12 to 0.14, twice as good as other trailer body insulation materials.

While bonding of urethane foam to trailer walls adds structural strength, Brown Trailer regards as more important the fact that it gives support to interior panels under impact during loading or unloading. Another factor is ease of repair. If, for instance, a fork-lift truck makes a hole through the inner wall, damaged insulation can easily be trimmed out and replaced by a block of urethane foam trimmed to fit. The patch can be bonded, if desired, with a small quantity of foaming mixture.

Containerization, particularly important in warehouse-to-store distribution, has also benefited from use of urethane foam. In Safeway Stores' Omaha district, for instance, replacement of insulated canvas bags with urethane insulated plywood containers resulted in substantial savings in dry ice costs (FE, Jan., 1961). (End)

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New and improved techniques of process drying, exclusively employed by Firmenich, yield powdered flavors that flow freely, are dust free, and give you the finest precision in flavoring your products. These important developments in quality flavoring will improve the taste appeal of your products . . . extend their shelf life . . . give them package-to-package uniformity that captures customer preference. Samples of Firmenich Powdered Flavors, with technical information on their practical application, on request.

CIRCLE 53 ON INQUIRY CARD

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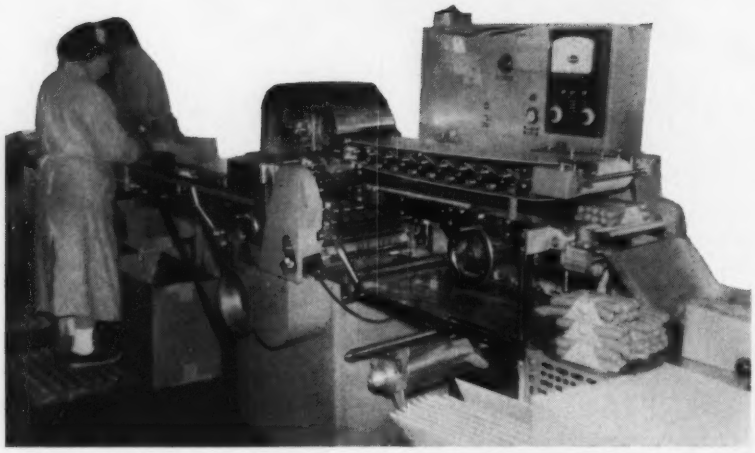
COLLARS are placed around franks by hand before being fed into . . .



STRAIGHT LINE UNIT that packages meat products at 80 packages/min. with minimum changeover time and increased labor and material savings.

Slashes Film Wrapping Costs

Economy, versatility, and speed are combined in this new unit designed for meat products packaging

FILM WRAPPING COSTS are cut by one-third with a new-type machine that handles a variety of films with minimum changeover time and noticeable material and labor savings.

These are the benefits reported by Mr. Harold Graham, planning & engineering v.-p. at Weiland Packing Co., Phoenixville, Pa., where the new packager has been successfully used for several months in cellophane wrapping of collared frankfurters.

Unit handles any of the presently available commercial plastic films (including new shrink types) in rolls up to 13 in. wide, at speeds up to 80 packages/min. In addition to franks, it can also package luncheon meats, cheese, collar-packed sausages, and other meat products. Wrapper accommodates up to one lb. round (3 to 4⅞ in. dia.), square (3x3 to 4½x4½ in.), or rectangular (3x3x½ to 6x4½x 2½) shaped packages.

Noting recent retail emphasis on collar-packaged franks and sausages for more eye-appeal in the case, Weiland adopted the new style in place of the cardboard tray method it had been using. Collar packaging proved to be a slow hand operation. Firm sought an automatic method that would not sacrifice the obvious economic factors of small plant production schedules. The "Straight Line" unit, made by Crompton & Knowles, filled the bill. Graham reports wrapping time cut to a fraction with the machine operating at only one-third its capacity.

How It's Done

At Weiland, encased franks are fed into an automatic peeler where coating is peeled off by a series of rollers. Franks are then placed in their collars by hand and fed into the Straight Line unit.

A distinctive feature of the machine is the air jet that floats film past the cutoff knife. Film is held firmly on two endless belts by two rows of steel balls which prevent shifting in any direction when belt stops. Material is then cut to exactly the required size, thus eliminating human error and film waste.

An important refinement is the discharge conveyor. It consists of a flat bottom belt of Teflon-impregnated fibreglass and a Neoprene-covered top belt. Packages are carried over a heater plate to a water-jacketed cooling plate. Top belt provides pressure needed to insure an unusually tight bottom seal. For cellophane sealing, temperature is regulated to over 500F. Unit may be adjusted to lower temperatures for other films.

The name "Straight Line" comes from the fact that the longitudinal axis of unit's discharge conveyor and that of infeed conveyor are on the same straight line. As Weiland plant personnel noted, each part may be reached quickly and easily for cleaning or making adjustments. Film changeover takes 10 to 12 min., they report.

Size changes are extremely simple to make, they add.

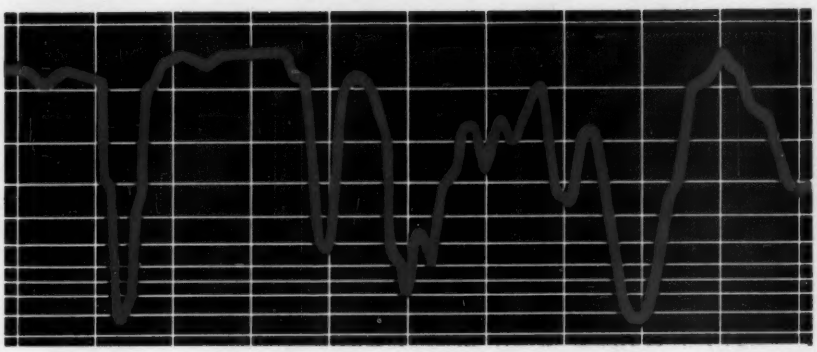
Located on a central panel, all controls are always in full view and easily accessible to the operator. Material wastage caused by failure to turn on certain controls is therefore kept to a minimum, Weiland v.-p. says.

Special equipment now offered includes registration control, a central lube system, card feed, and card ejector. Weiland added a heater at end of discharge conveyor where shrink type films are heated to a tight fit around the product. (End)

LAWRENCE J. WOODWARD
Editorial Assistant, "Food Engineering"

CIRCLE 55 ON INQUIRY CARD ➔

The Molecule's Fingerprint



In human identification a fingerprint is regarded as an infallible characteristic of the individual. In chemical analysis a substance is characterized just as unmistakably by its spectrum. The use of spectroscopy as a modern means of quality control serves as a check on manufacturing and thus guarantees uniform quality. Spectroscopy has in addition become an indispensable tool in our physico-chemical research laboratories for both research and development.

We have published a booklet entitled "Absorption Spectroscopy", and shall be pleased to place it at the disposal of interested parties upon request.

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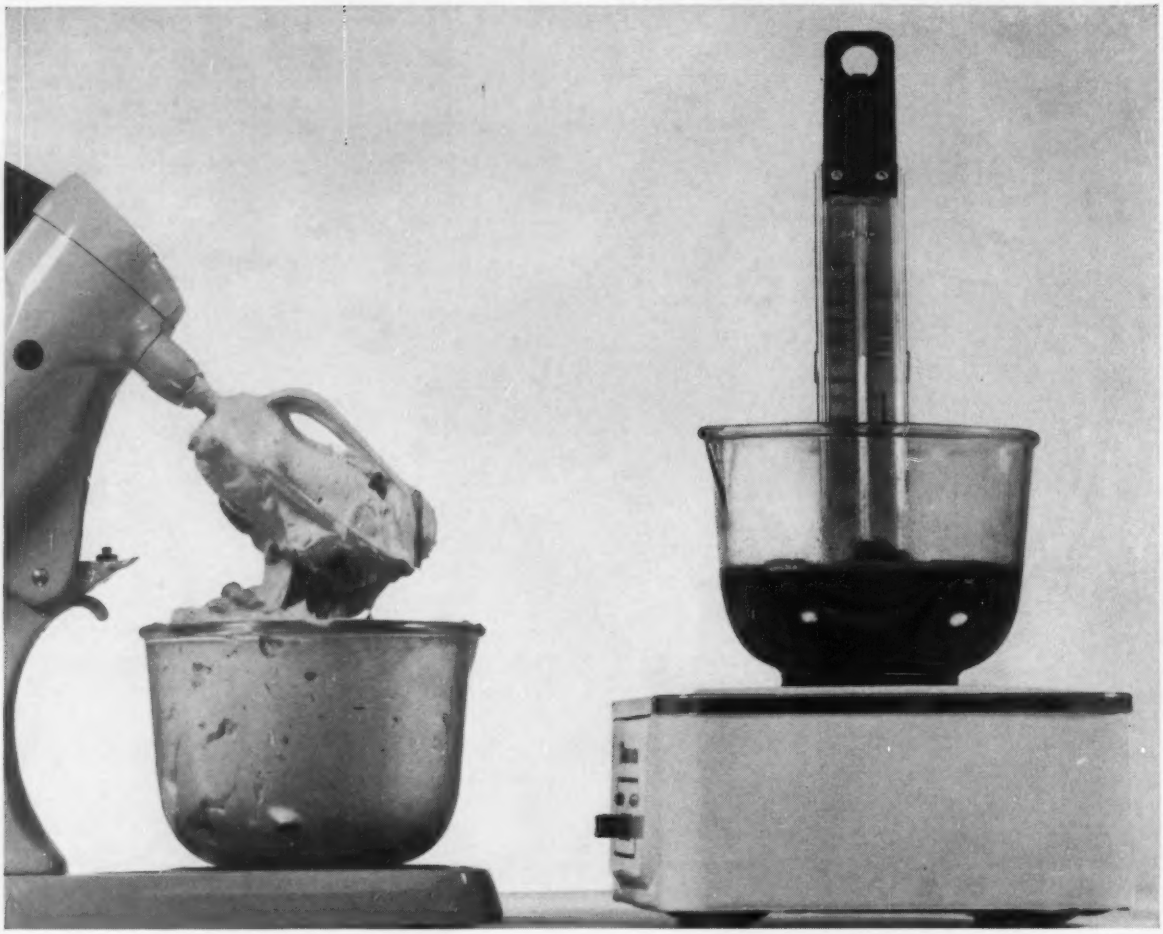

To foam or not to foam?

We can help you either way

If you are interested in the miraculous new fruit-fluffs or fruit-freezes, read this:

The bowl on the left contains grape juice in the form of a fruit-fluff. It has about 18 times as much volume as when we put the juice in the bowl and beat it. All it took was a small amount of either of those types of *Myverol*® distilled monoglycerides which we make from hydrogenated lard or hydrogenated cottonseed oil, plus whipping.

We could have put a trace of the same material with the grape juice, or with any other fruit juice or puree, and whipped it while freezing. The result would have been a low-calorie frozen dessert we call a fruit-freeze.

If you are interested in foam suppression in food processing, read this:

The bowl on the right contains more of the same grape juice boiling without the usual troublesome foaming because we added a small amount of another type of *Myverol* distilled monoglycerides we make from an unsaturated vegetable oil.

Now that you are interested, tell us in what, and we'll send samples of the right types of *Myverol* distilled monoglycerides, together with technical data, so you can whip up or conquer some foams of your own, or create a new product, perhaps.

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DPi

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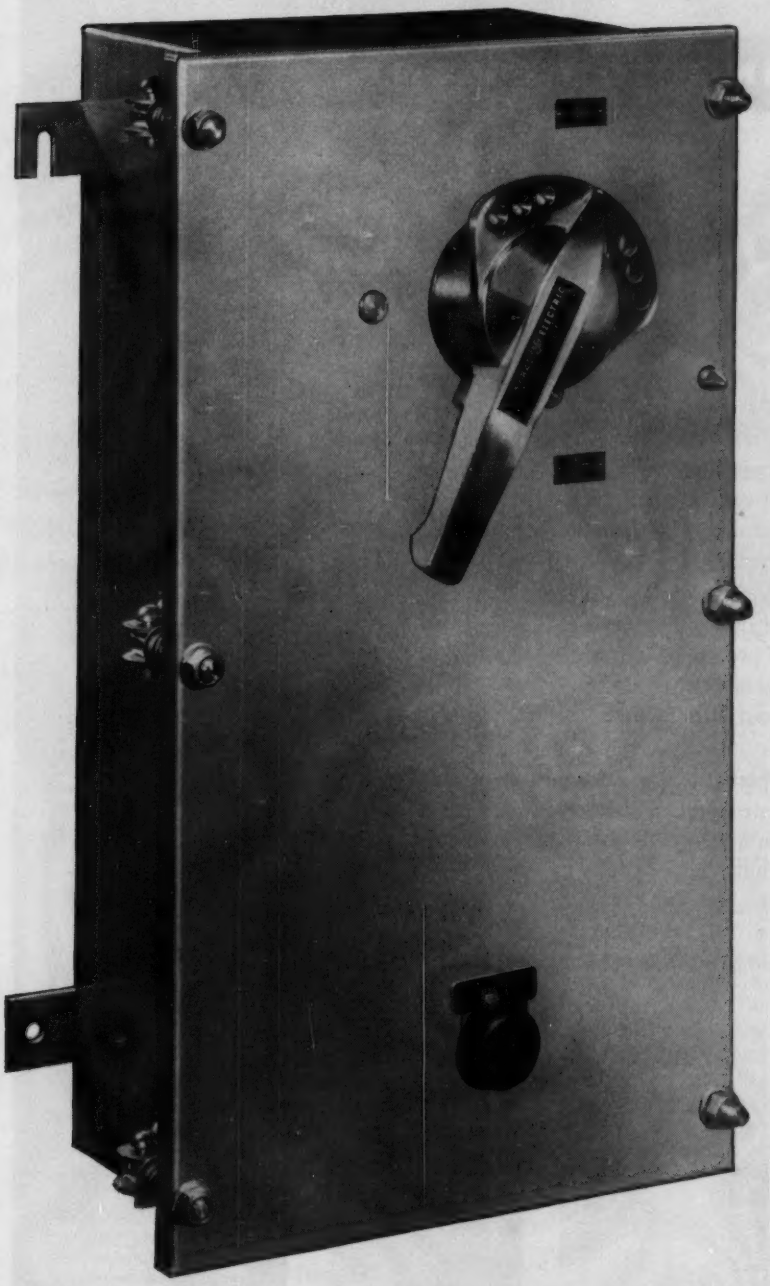
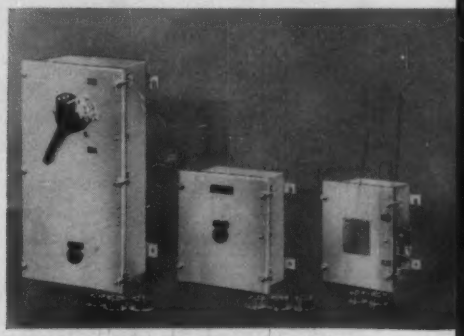
FROM GENERAL ELECTRIC . . .

Stainless Steel Enclosures Eliminate Corrosion on Watertight Applications



Better appearance with no maintenance—Brushed satin finish of General Electric enclosures matches your other stainless equipment, saves you maintenance costs because it never requires painting. You can clean it with a hose without affecting finish. High-nickel stainless steel (Type #302) enclosure has tremendous corrosion and rust resistance.

Simplified installation and greater accessibility—Mounting brackets have keyhole slots allowing you to hang enclosure over screws while tightening. You can locate conduit openings where convenient because *separate* chromium-plated watertight hubs are supplied. Conduit holes are not "cast-in" as on NEMA IV enclosures. Cover is hinged—you don't need to remove it to perform routine inspection and maintenance.



Forms available—You get fast shipment on all forms: CR1062 integral hp manual starters; and CR106, CR7006 across-the-line magnetic starters, or CR107, CR108 and CR7008 combination magnetic starters, in NEMA Sizes 0 through 5.

Now you can eliminate the corrosion and maintenance problems common with cast-iron starter enclosures, and get the appearance and sanitation benefits of stainless steel enclosed starters . . . for all watertight applications. Ask your G-E sales engineer or distributor today, or write for publication GEA-7324, Section 813-38, General Electric, Schenectady 5, N. Y.

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GENERAL ELECTRIC

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FREEZE DRYING EQUIPMENT

By

Amsco *Del-Vac*

The increasingly vital role of freeze drying in the preservation and concentration of critical substances demands better engineered, more versatile apparatus. Now Amsco Del-Vac Freeze Dry Apparatus fulfills this need within laboratories, pilot plants and production facilities.

Significantly finer performance and versatility of Amsco Del-Vac Freeze Drying equipment permit the direct transfer of process data from laboratory or pilot models to large scale production models . . . without intermediate stages of pilot operation.

Whatever your freeze dry needs . . . whether you require heated, refrigerated process shelves; hydraulic stoppering shelves; a powerful, built-in 5 to 10 micron vaccum pump; or fully automatic controls . . . Amsco Del-Vac has an appropriate model.

Write for fully illustrated brochure IC-606.

Most advanced pilot and light production freeze dryer available . . . Amsco Del-Vac Model 22424RHVM, with heated and refrigerated process shelves, hydraulic stoppering shelves, 5 to 10 micron vacuum pump . . . The ultimate in freeze dry efficiency.

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ERIE • PENNSYLVANIA

Scientific and Industrial Department

World's largest designer and manufacturer of Sterilizers, Operating Tables, Lights and related biological equipment

Practical Ideas

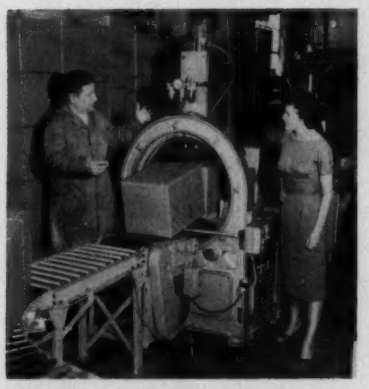
Visual Aids Help Meet USDA Grade Standards

Many fruit and vegetable processors are using visual aids to help interpret USDA grade standards for various canned, frozen, dried, and dehydrated items.

For example, a model of a strawberry showing the darker limit of 'good red color' required for U. S. Grade A gives inspectors all over the country the same standard.

The Fruit & Vegetable Div. of the Agricultural Marketing Service, Wash., D. C., has developed over 300 visual aids—illustrations, photographs, and models showing blemishes, defects, size, shape, and color; also plastic and glass color comparators.

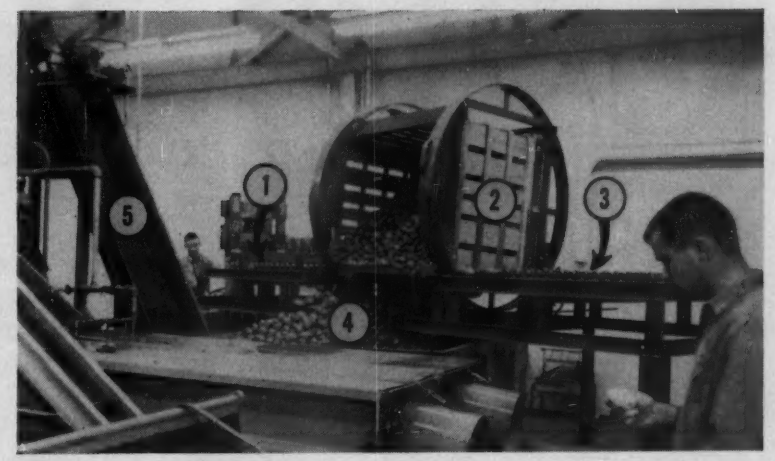
Originally designed for use by inspectors, they can now be purchased through AMS from firms licensed to offer approved copies. A total of 63 aids is now available, the first model of each product having been made by AMS artists.



Photocell Gages Carton, Controls the Strapping

Fully automatic, this carton strapper has a 'magic eye' that first scans various size cartons. Then, it adjusts to apply the proper number of round steel straps—tensioning, tying, and cutting them.

Unit is made by *U. S. Steel, Supply Div., 525 William Penn Pl., Pittsburgh.*



COMPANY-BUILT DUMPER, under pushbutton control, receives crates of potatoes from infeed conveyor (1), inverts the crate (2) to discharge the spuds into hopper (3). Empty crate leaves on conveyor (4), potatoes go to stoner-washer (5) for chip making.

Dumper Speeds Potato Processing

At Hiland Potato Chip Co., we receive potatoes in 1,200-lb. capacity wooden crates built on pallets. Sides of the crates are wire-hinged so they can be easily set up or knocked down. When emptied, they are knocked down and returned to growers for re-use.

To facilitate fork-truck handling from raw-potato storing and curing rooms, we devised and constructed an electrically-operated roll-over crate dumper. Built in our own machine shop, it feeds the potatoes to our chip processing line. Specifically, spuds are automatically dumped into an above-the-floor hopper feeding an inclined flight conveyor that discharges into a stone separator-washer.

The unit comprises a supporting frame of horizontal and vertical angle irons. The cyclindrical roll-over dumper, which was made of rolled flat sheet metal, and the in-feed and discharge conveyor systems are mounted on this framework. The in-feed section consists of a pair of skate rollers on each side, plus three rows of bottom skates and live rollers on the bottom.

The dumper is 4-ft. in diameter and is mounted 3 ft. above the floor. It's electrically driven by ¾-hp motor through chains.

In operation, crate loads of spuds are raised onto the in-feed section. Feeding is pushbutton-controlled by indexing loaded crates into the dumper and empty crates out of it. Pushbuttons also control the dumper's forward motion (for dumping) and return of empty crates to discharge position.

—N. C. Rasmussen, Plant Manager, Hiland Potato Chip Co., Des Moines, Ia.

Re Ball Bearings

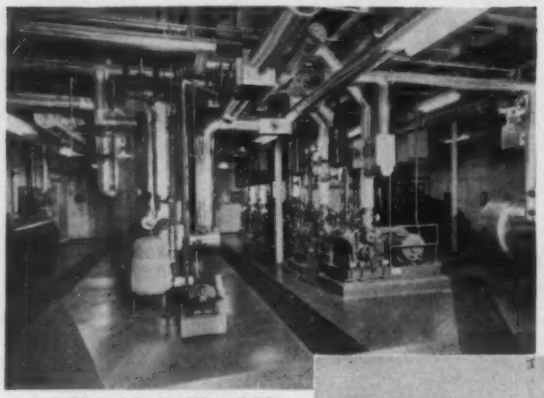
Modern ball bearings have remarkable endurance even under the most severe operating conditions, attributable mainly to proper lubrication.

Bearings should not be allowed to overheat, but some warmth is

Borden's New "Dairyland Showcase" plant relies on an all-Vilter Refrigeration System

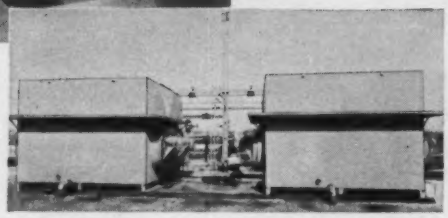
With 110,000 square feet of floor space, Borden's new $3,000,000 Milwaukee milk and ice cream plant is one of the most up-to-date and modern dairies ever built.

Borden's



Overall view of compressor room showing the six Vilter ammonia high-stage VMC compressors, Vilter brine cooler and liquid receiver. Five rotary booster compressors are installed in a line behind the intercooler.

View of the two Vilter VP350 evaporative condensers which handle the discharge from the compressors. A center partition in each unit provides an efficient means of reducing capacity and maintaining desired head pressure during cold weather.



500,000 quarts of milk a day! 5,000,000 gallons of ice cream a year!

These are the very imposing capacities of Borden's new Milwaukee milk and ice cream plant—the largest in Wisconsin.

An extensive all-Vilter system provides the refrigeration for the varied requirements of this plant. *Four* separate methods of refrigeration are employed—direct expansion, liquid recirculation, flooded and brine.

Borden's compressor room contains six Vilter ammonia VMC compressors and five boosters. A 42" x 10' Vilter intercooler is installed between the two stages. Handling the discharge are two Vilter VP350 evaporative condensers.

Each day the largest sweetwater tank installed in the state of Wisconsin chills 670,000 gallons of water to 33° which, in turn, holds the pasteurized milk storage tanks at 38°. Fifteen air units provide the refrigeration for the milk cooler, and forty-four truck charging positions accommodate the milk delivery fleet.

Other major Vilter equipment includes a hot gas defrost blast freezer for Borden's mammoth ice cream hardening room and a brine cooler for ice cream bar freezing.

All equipment selected by Borden was chosen to perform its job efficiently, quickly and insure the most sanitary, pure and wholesome products. Vilter is proud to play a part in this, Borden's "Dairyland Showcase."

Why not check with Vilter on your refrigeration problems?

Vilter® refrigeration air conditioning

Vilter Manufacturing Corporation

Milwaukee 7, Wisconsin

Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake ice machines.

Write for your copy of bulletins covering above equipment to Vilter Manufacturing Corporation, Dept. E-603 2217 South First St. Milwaukee 7, Wis.

normal. Occasionally, the grease itself is the cause of this warmth. At startup, grease in a bearing is cold. In time, sufficient heat is generated to thin the grease, which is then expelled from contact and rotating parts. Thereafter, bearing temperature may actually drop.

Therefore, adding lubricant to a warm bearing can be a mistake, because an excess can raise its temperature.—*W. F. Schaphorst, M. E., 45 Academy St., Newark, N. J.*

Sanitary Containers Store Production-Line Overflow

This 18-gal. polyethylene container, lightweight and easy to sterilize, is finding acceptance among potato-chip processors as a temporary storage receptacle for production-line overflow.

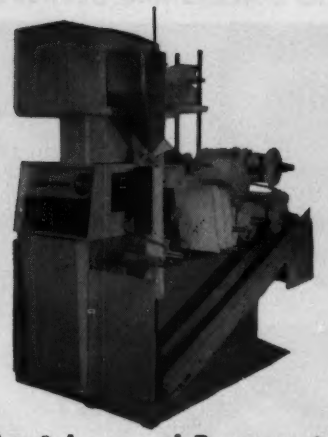
Used as collection depots at ends of conveyor belts, or as storage units almost anywhere in the process, the dent and rustproof containers hold unbagged chips under sanitary conditions for subsequent packaging. Units are 16x20 in., weigh 6 lb., and are available with lids in groups of four from the *Potato Chip Institute, 946 Hanna Bldg., Cleveland.*

Explosion-Proof Light Bulb

A common safety hazard—exploding light bulbs—has been overcome by a new incandescent lamp employing silicone adhesives and glass yarns.

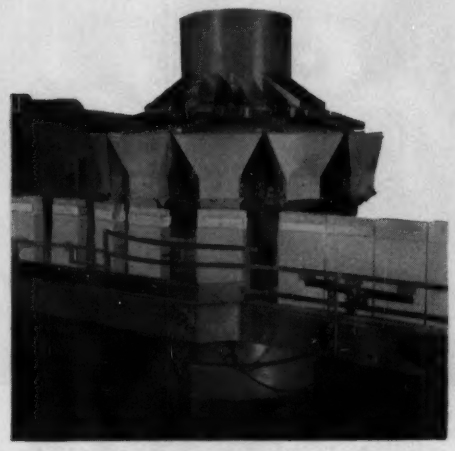
Called "Flamescent," it can be dropped onto a hard surface without exploding into a shower of glass. While hot, it can be dipped in ice water without danger of flying glass fragments. A glareless bulb with high lumen output, it is said to last at least three times as long as conventional lamps. It is supplied by *Duro-Test Corp., North Bergen, N. J.*

Do You Have Packaging Problems?



Wright Advanced Bagmaster®

Completely automatic system to make the bag, electronically weigh and fill the product, and seal the bag. Advance features permit the precision packaging of multi-dimensional products.

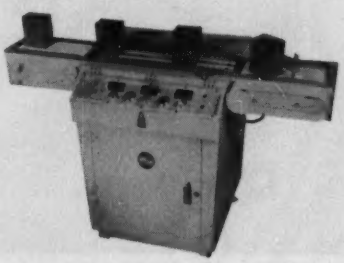


Wright NT Weigher

A completely automatic rotary net weigher for high speed packaging in containers the total output of a continuous process.

M-2 Hy-Tra-Lec® Weigher *with New Speed Fill Turret*

A Semi-Automatic System to precision weigh a wide variety of products into bags, boxes, jars, or cans. The new Speed Fill Turret allows greater ease and speed for attendant.



Wrightronic® Checkweigher

100% checkweighs articles in motion at high speeds with extreme accuracy. The unit can be used to reject packages over and under acceptable weights. Counters provide total production tally of over, under, and correct weights.

Wright Machinery Company has a complete line of weighing and filling equipment for free-flowing, hard to handle products for manufacturers packaging ½ ounce to 16 ounces. Wright engineers will adapt the recommended machine or system to suit your requirements. Speed, accuracy, and gentle product handling are features included in all equipment. For information on how Wright can solve your packaging problems, write us on your letterhead; for detailed information on above machines, just fill out the attached coupon.

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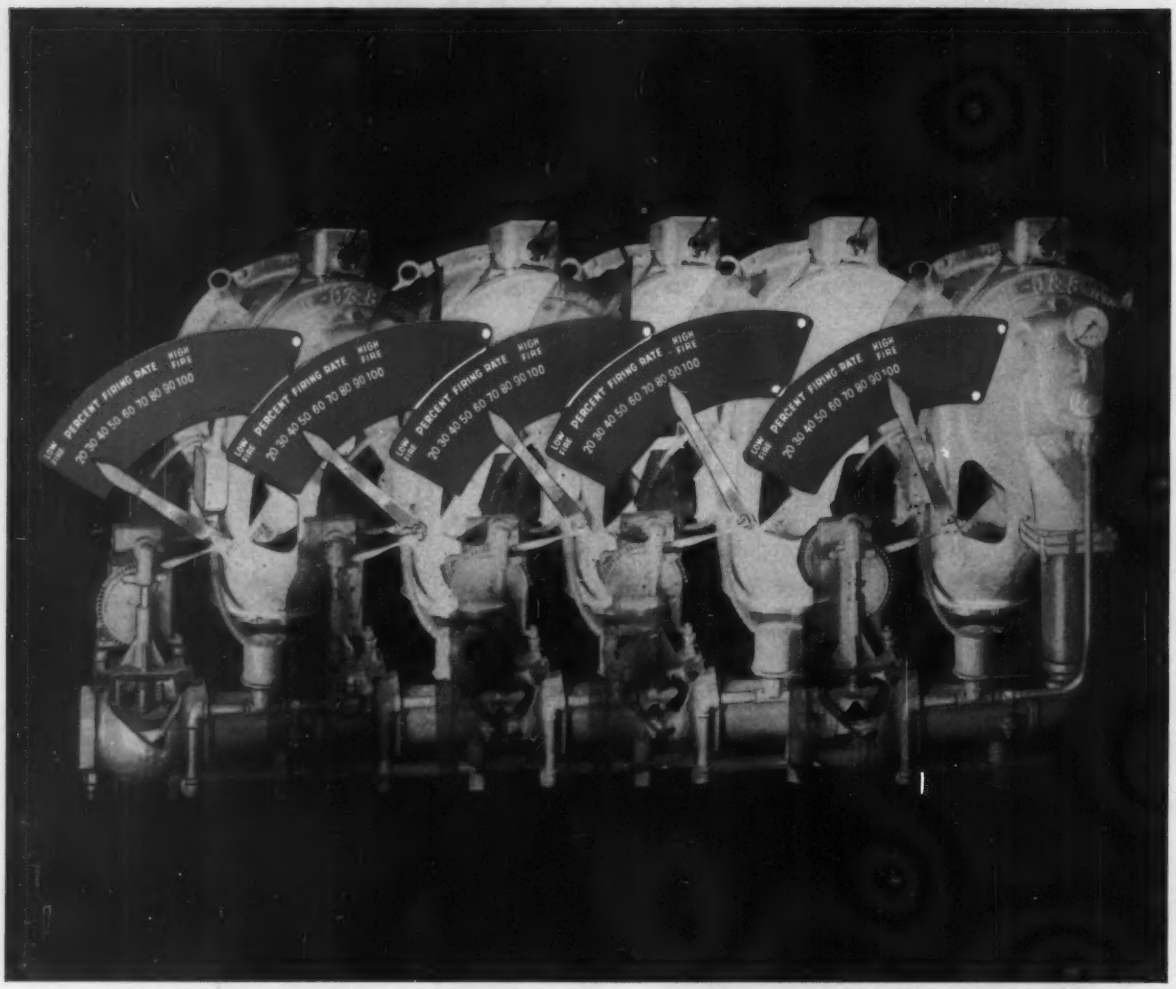
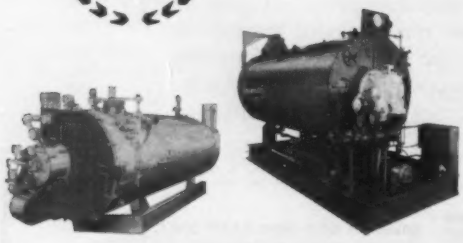


Why *Powermaster*® returns your original investment faster

BUILDERS OF BETTER BOILERS SINCE 1885



One reason is its exclusive 5 to 1 turndown. Another feature gives you the same low percentage of excess air (2.8% O_2) and high percentage of CO_2 (13.5%)—at *all* loads, from 20% to 100% of capacity.

High constant efficiency at every operating load means immediate and impressive savings in fuel, maintenance and man hours.

Before you buy any boiler, it will pay you to investigate the many *other* extras that make *Powermaster* the "most engineering endorsed" packaged boiler in the world. Call your nearest O&S representative or write for Bulletin 1260.

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CIRCLE 62 ON INQUIRY CARD

Doing It Better

HANOVER CANNING CO.

Simplifies Can Handling

A magnetic conveyor, carrying 7-lb. cans up a 35-deg. incline, eliminated the need for seven different-size bar elevators at Hanover Canning Co., Hanover, Pa. Savings are estimated at more than $10,000.

The 19-ft. line is especially magnetized to hold cans securely as they ascend the slope at speeds ranging 500 per min. At the top, they are gripped magnetically by a roller magnet positioned under the belt and transferred to another line.

The system was engineered by Eriez Mfg. Co., Erie, Pa. (203)

BEFORE TEFLON LINING was applied to scale interiors, molasses deposits had to be scraped off.

WITH TEFLON, molasses doesn't accumulate and a wet sponge does the cleaning. Labor saving: 90%.

DOLLY ADAMS CO.

Uses Self-Cleaning Filter

This diatomaceous-earth filter has cut the cost of producing high-clarity vinegar at Dolly Adams Co., Van Nuys, Calif.

Whereas the filter previously used had to be cleaned manually every 8 hr., this one is cleaned automatically by the vinegar during a backwashing cycle. Vinegar thus used is recovered in a tank beneath the filter, then is strained and reprocessed.

The unit, designed to filter some 57,000 gal. per day, was supplied by Swimquip, Inc., El Monte, Calif. (202)

BEACON MILLING CO.

Speeds Handling of Sticky Products With Teflon

By lining its automatic molasses-feed scale with Teflon sheet, Beacon Milling Co., Cayuga, N. Y., has eliminated production stoppages caused by scale clogging. This has saved $1,700 a year.

Moreover, the Teflon lining has also ended manual scraping of molasses deposits at least twice a day. And this has saved an additional $5,000 a year. Cleaning time has been cut to about 15 min. a week—a 90% reduction.

The molasses, which goes into animal feeds, is usually hard to handle because of its stickiness. Yet, the scale hasn't clogged once in four years of continual use. The syrup adheres to Teflon only as a light film, which is easily wiped clean.

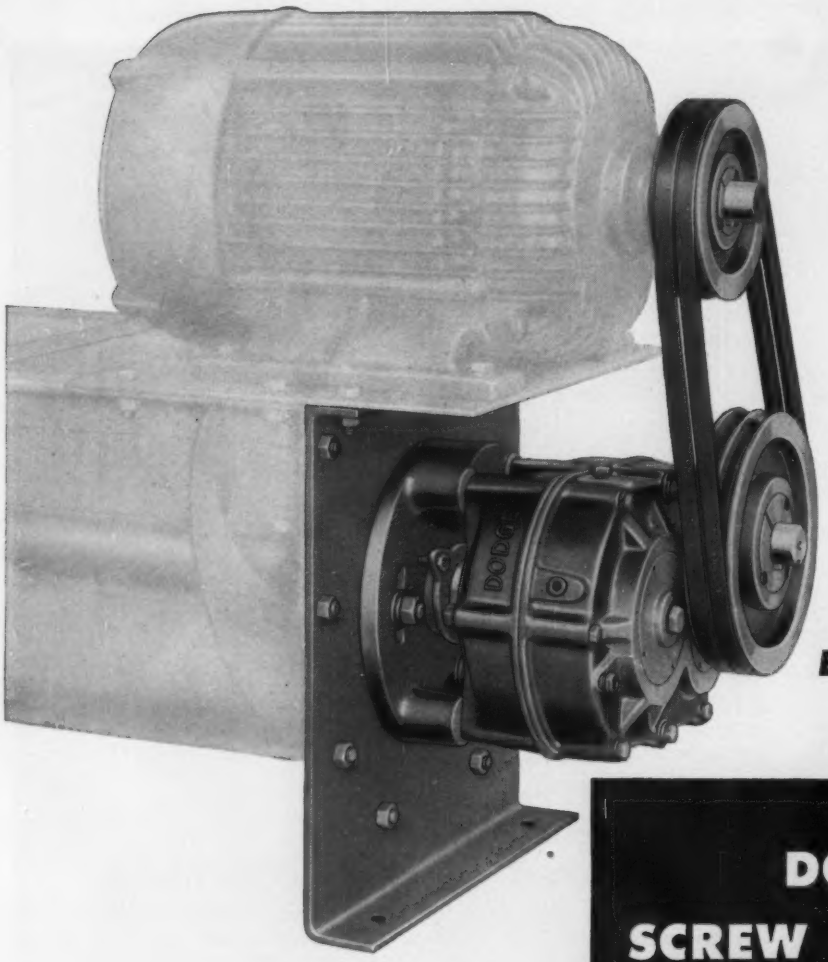
Teflon sheets, 1/16-in. thick, were applied to the scale's various plates and to the feeder housing's belt section. Attaching the sheets was a problem solved by a special bonding process, since no known adhesive sticks to Teflon and bolting proved unsatisfactory. One side of the sheet was etched to provide a suitable surface, then bonded to the scale surfaces with special adhesive.

The sheet fabrication technique was developed by Raybestos-Manhattan, Inc., Manheim, Pa. (201)

Pet Milk Co. now ships all tall-size evaporated milk cans in cases using the time-saving 'tray-pack' method. Trays carry sales-promotion messages which also increase the attractiveness of shelf displays. Cases are made by Owens-Illinois, Toledo, Ohio. and others. (206)

Lea & Perrins overwraps its Worcestershire Sauce bottles at 90 per min. by heat-sealing. Automatic unit cuts polyethylene-coated paper from a roll, wraps it around the bottle neck, and heat-seals in place. Machine was supplied by Halm Instrument Co., Glen Head, L. I., N. Y. (207)

Hershey Chocolate Co. curbs screen blinding in sifting of cocoa nibs with special vibrator developed with Sprout, Waldron & Co., Muncy, Pa. (208)



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Entirely Different!

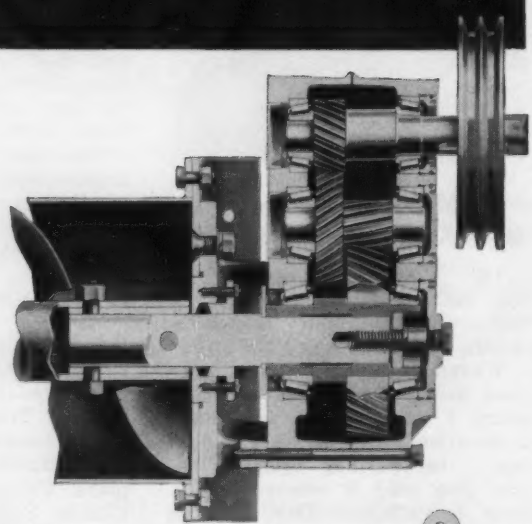
DODGE SCREW CONVEYOR DRIVE

A complete package drive, including

- **Rugged, high-efficiency Reducer.**
- **Quick-removable Driving Shaft.**
- **External Packing Gland.**
- **Trough End (optional).**

Amazing new ease of installation—new ease of maintenance—new economy! No external thrust bearing or motor base is necessary. (However, a motor base of special design is available as optional equipment.) Pre-selected Taper-Lock V-Belt drives give required speeds. Built-in puller makes it easy to change driving shaft—without opening reducer. External packing gland protects reducer. Helical steel gears. Timken Bearing equipped throughout. Available from stock with 1½", 2", 2 7/16", 3" and 3 7/16" driving shafts. Ask your Dodge Distributor, or write us for bulletin giving complete technical data.

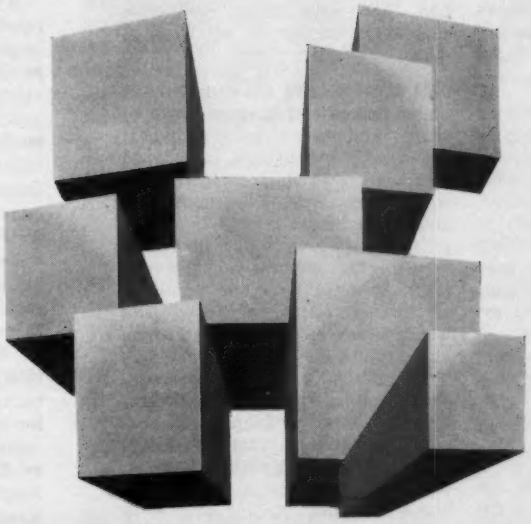
DODGE MANUFACTURING CORPORATION, 2800 Union, Mishawaka, Ind.



DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Equipment."



CONTAINERIZATION

This modern shipping concept is moving at a fast and promising pace. Here are equipment and systems available plus industry applications and predictions for piggy-back, fishy-back, birdy-back, etc.

UNDOUBTEDLY, containerization will have a tremendous effect on the nation's transportation system. Enough has been done with this comparatively new concept of material handling and distribution to point up a big potential in better efficiency and cost savings.

Here's how some leading food industry executives view the future of containerization:

. . . "There is no reason why, some day, completely interchangeable shipping (truck to ship to rail to air) will not be a reality."—**Frank Armour, Jr., President, H. J. Heinz Co.**

. . . "Containerization in shipping should enable the industry to handle certain shipments much more efficiently and with a substantial reduction in shipping costs."—**Evan Girton, Gen. Traffic Mgr., Wilson & Co.**

. . . "We are firmly convinced that there is a good future in containerized shipping in the food industry."—**H. H. Lincoln, Asst. Mgr., Distribution, Standard Brands, Inc.**

. . . "I am convinced containerization is an area in which we will see significant change in the next five years with a consequent sharp reduction in handling costs."—**W. H. Gribble, Distribution Director, Pillsbury Co.**

However, the problems that must be overcome to make containerized shipping more fully accepted are many and complex. And one difficulty is finding a workable and understandable definition of just what containerization is and is not.

Though the term is coming into more and more use, it does not mean exactly the same thing to every industry executive. Reason for this diversity of opinion and definition is probably the result of many fast-breaking and well-publicized developments in shipping. Almost anything that differs from historic shipping techniques is conveniently referred to as a form of containerization.

Simply, containerization is the principle of using a large physical envelope—usually steel, aluminum, or wood—to consolidate many individual units or packages for efficient handling during shipment. Boxes or containers often can be transported by rail, truck, ship, and air carriers, interchangeably.

In effect, containerization is therefore an extension of the unit load principle that combines transportation with packaging, materials handling, and distribution. Main difference is that the product, or products, lie in a container. Usually, the container is reuseable.

FE Staff

Containers: Types and Sizes

A variety of freight containers can actually be used in containerization. Broadly, they include pallet containers, cargo containers, and van containers.

PALLETS are the smallest group of freight containers that correspond in general range of sizes to industrial palletized unit loads. Recommended sizes are designed to fit snugly one, two, three, or four abreast in the standard boxcar, gondola, and highway van. Base area, according to ASA, should not exceed 32 sq. ft.

Pallets may be of permanent rigid construction for frequent use, collapsible or knockdown construction, or expendable. They may have open or closed tops; hinged, folding or removable sides or ends; hopper bottoms; and have solid, expanded, perforated, or mesh metal construction. They might be mounted on legs, skid runners, casters, or be flat bottomed, depending on the type of service or material to be handled.

CARGO CONTAINER is larger than the pallet and has weatherproof construction for outdoor storage and transportation in open cars, trucks, barges, or ships. They're used for both bulk materials and merchandise. Rugged construction particularly adapts them to crane handling and interchange between open highway, rail, and water transportation. ASA says cargo containers should not exceed 64 sq. ft. base area.

VAN CONTAINERS are demountable trailer bodies and cover a range of sizes from small to the largest trailer unit and usually include all containers with no less than a 64 sq. ft.-base area. Construction is heavier and more rugged than conventional truck or trailer bodies to take the higher static and dynamic loads imposed by crane handling, lift trucks, roller conveyors, and transport on railroad cars and ships.

Van units may be transported by highway, rail, water, and air. Consequently, size and gross weight must conform to highway dimensions and weight limitations of various stages, foreign highways, hoisting capacity of ships, and cargo space available.

BULK FREIGHT containers, used for handling crushed, powdered or fluid material are another type of container that fit the containerization concept. This type of unit, in use for several years, includes all sizes of pallet and cargo containers, along with the smallest van sizes.

Bulk freight containers may have open or closed top hatches, and may be emptied by drop bottom, controlled discharge hopper gates or pumps or be flipped over. All sizes should be arranged for tiering in storage and aboard ship.

Looking at the overall high price of transportation, containerization might also be referred to as an effort to put products into huge boxes to decrease handling, speed delivery, and generally reduce the rising costs of distribution. Movement of goods offers big savings through better methods. And it is a major area of expense, judging by USDA which estimates that about 15¢ per marketing dollar goes toward transportation.

While all benefits certainly won't accrue to every manufacturer and shipper of food products, here are the advantages most commonly claimed for containerized freight handling:

1. Lower handling costs.
2. Lower in - transit insurance costs.
3. Lower freight costs.
4. Reduction of products damaged and pilfered.
5. Faster and more efficient delivery.
6. Reduced overall labor costs.
7. Better protection of product quality.
8. Lower manufacturing costs.

Need Standards

Most obvious difficulty and the one that will be hardest to overcome is standardization of containers. Various industries want certain sizes and types, while carriers have their own specifications most compatible with their equipment. This diversity of specifications is probably the main reason why containerization has not advanced more spectacularly than it has. (See panel on container types.)

Most active group attempting to eliminate or alleviate this problem is the MH-5 Containerization Committee of the American Standards Assn. A combination of representatives of various industries and suppliers, this group was established to make final recommendations for Freight Container standards for the overall national system of transportation. (See panel on accepted dimensions.)

Aside from standardization roadblocks, other almost equally important problems are evident:

► **High cost of returning** empty containers when no return load is available.

► **High initial investment** in containers and handling equipment despite potentially fast obsolescence.

► **High quantity of paperwork** necessary to proportion payment or insurance claims to various carriers transporting the same containerized product.

► **Extra maintenance,** depreciation, and rental charges for containers.

► **Lack** of an adequate freight rate structure.

► **Labor difficulties** created by displacing workers involved in handling and transporting freight shipments.

► **Extra freight charges** due to additional weight of containers.

Last expense can be minimized by arrangement with railroads using standard container cars. In addition, lightweight construction material such as aluminum also eases extra weight problem.

Hormel Pioneers

Clark Equipment Co. has worked with a number of food companies, and two cases deserve mention—George A. Hormel Co. and Albert Schwill Malt Co.

Actually, Hormel has two container systems. First is a rail-truck operation between Austin and Chicago begun late in '56. Operation involves a daily shipment of one 53-ft. flat car loaded with four 11½-ft. refrigerated containers to the Fulton Market Yards. Loaded containers (route packed) are placed on city delivery truck chassis and four empties are immediately placed back on flat car by lift truck. Car is pulled and on its way back the same day.

Containerization reduced cross-dock loading time from 2-4 hr. to approximately 10 min. Since drivers loaded, delivery time was decreased by 25% and a larger market could be reached without increase in labor or road equipment. Containerization eliminated spoilage and shrinkage problems and permitted Hormel to make store door delivery with meat temperature controlled within 1°F. of factory loaded temperature. Pilferage was eliminated as well.

Hormel, Clark, and the North

American Car Corp. also inaugurated the first complete over-the-road truck delivery service hauling refrigerated meat from Austin to the Twin Cities. This highway trailer/truck service saved time, expense, and completely eliminated the previously necessary operation of unloading a large highway reefer at the Twin Cities branch and reassembling and loading the meat into a number of smaller refrigerated city delivery trucks.

According to Hormel's general transportation manager, E. M. Flitton, "Our products now arrive at a customer's store exactly as they leave our packing house. Method keeps meat completely sealed from outside air and sunshine at a constant temperature to prevent shrinkage." System has helped Hormel to label their products the "freshest meat in the world."

Some 23 pieces of equipment purchased from Clark's Brown Trailer Div. are used for the operation: 12 mobile reefer containers, two 40 ft. aluminum flatbed trailers with two tandem axles, one Y200 fork truck, two GMC 860 diesel tractors, and six 2-ton city delivery chassis.

Meat is loaded according to route and customer order on a last-in, first-out basis. Bulk of the meat is loaded by conveyor directly into the 11½ x 8 x 7-ft. 8-in. containers. After delivery of meat, containers are loaded with empty lard cans, supplies and other materials for trip back to Austin.

The Clark Mobilvan System of compatible rail-highway containers is employed at the Albert Schwill Malt Co., Chicago. Firm supplies the parent Falstaff Brewing Co. in St. Louis with a large percentage of its barley malt.

As Falstaff plant was not located on a rail siding, malt was moved from Schwill to St. Louis by highway trailer type bulk carrier. But barley from the north arrived in Chicago by rail car.

System allowed Schwill to have barley shipped to St. Louis on one bill of lading by rail with an "in-process" stop at Chicago plant for processing into malt. It is then loaded into containers on rail cars and moved to St. Louis. Containers are transferred by lift truck to trailer chassis for movement into the Falstaff plant.

Result was a tremendous savings in material handling as well as a lower all rail rate.

Service utilizes a 17-ft. bulk Mobilvan, two to a 38-ft. Adapto car, handled on the Chicago, Rock Island and Pacific RR. and the Chicago Eastern and Illinois RR. Transfer operation at St. Louis is sub-contracted service performed by the Hamm Drayage Co. at their rail siding.

Other trailer container manufacturers such as Fruehauf, and Trailmobile have been achieving marked success in sale of units to many carriers of food products.

Handling equipment, especially large van types, must be able to move a trailer or container interchangeably. According to suppliers, an all-purpose intermediate handling truck allowing 100% selectivity is needed for fast and efficient transfer.

Recommended Freight Container Dimensions

Container Type	Outside Dim. (L x W x H)	Capacity (Cu. ft.)
Van—40 ft.	40' x 8' x 8'	2,000
Van—30 ft.	29'-11¼" x 8' x 8'	1,860
Van—20 ft.	19'-10½" x 8' x 8'	1,035
Van—10 ft.	9'-9¾" x 8' x 8'	495
Cargo—Large	96" x 77½" x 96"	328
Cargo—Small	96" x 57½" x 96"	243
Master Pallet	108" x 88" x 80"	370
	108" x 88" x 60"	288
	108" x 88" x 40"	177
Jumbo Pallet	88" x 54" x 80"	177
	88" x 54" x 60"	128
	88" x 54" x 40"	85
	88" x 54" x 27"	53.5
Large Pallet	54" x 44" x 80"	88
	54" x 44" x 60"	64.7
	54" x 44" x 40"	41.7
	54" x 44" x 27"	27
Medium Pallet	44" x 36" x 80"	57.5
	44" x 36" x 60"	42
	44" x 36" x 40"	27.4
	44" x 36" x 27"	17.2
Small Pallet	36" x 29" x 80"	28.6
	36" x 29" x 40"	15.6
	36" x 29" x 27"	12.2

CONTAINER DIMENSIONS listed above were recommended by the MH-5 Sub-Committee and nominal van lengths approved by ASA. Note how pallet containers have been integrated to fit into larger van and cargo units. Racktainers of 40-, 30-, 20-, 15-, and 10-ft. lengths are also proposed by MH-5 but not yet submitted, as well as two lower cargo containers, and half- and quarter-size pallet types.

By Rail—Piggy-Back

Most notable of all containerized rail shipping systems is the Flexi-Van operation of such carriers as the New York Central and

the Chicago, Milwaukee, St. Paul and Pacific.

Central's system interchanges containers with 10 other railroads and several steamship lines, including States Marine, Trans-American, and American President Lines.

System handles both food and beverage products via containerization, including canned goods, fresh meats, bakery goods, cake mixes, soda, beer, and many other supermarket items. Following food firms are just a few of those using the Flexi-Van system: General Foods, Duffy Mott, National Biscuit, R. T. French, Swift, Armour, Kroger, A & P, Lever Bros., Procter & Gamble, and Nestle.

Used are regular 25 x 8 x 8½-ft., 36 x 8 x 8½-ft., and 40 x 8 x 8½-ft. vans (Strick Co.) with both side and rear doors. Some are fully insulated and others are semi-insulated. Also employed are light reefers as well as regular heavy-duty reefer vans, open-top equipment, auto carrier racks, and the marine type units.

N. Y. Central officials cite several advantages for this system, including:

► **Side-loading.** One or 100 trailer units can be handled simultaneously.

► **Tie-down crew eliminated.** One man, tractor driver, can either load or unload a trailer in about 4 min.

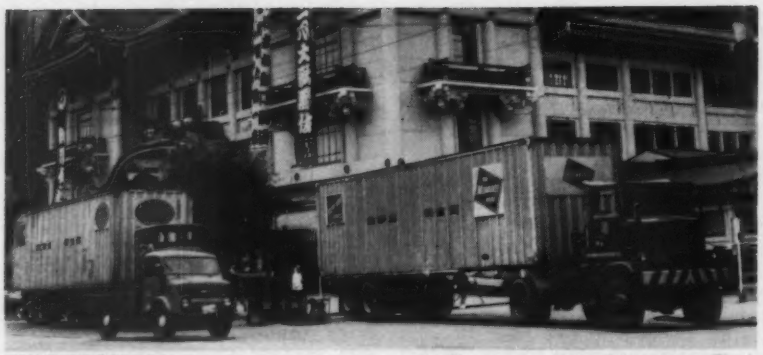
► **No special terminal equipment required.** Any railhead approachable by a tractor-trailer will suffice.

► **Roller bearings** permit passenger trains speeds and practically eliminate hot boxes.

► **Maximum car utilization.** Cars may arrive, be unloaded, reloaded with new cargo, and depart on the same day.

The Milwaukee Road offers similar benefits to users of its Flexi-Van service. Carrier also points to faster service as a method of savings through better inventory planning, reduced inventory costs, and warehousing overhead.

Railroad, which incorporates a far-flung system of Key Terminals for container pick-up, lists cus-



RAPID PROGRESS of containers for overseas traffic is emphasized by above Flexi-Vans traveling Tokyo streets. Vans, from Milwaukee Road and New York Central, suggest pilferage and damage-free distribution to expanded foreign markets.

tomers as Armour, Swift, Mars, National Biscuit, Hormel, and Theo. Hamm. Milwaukee Road officials report that food products have been shipped via this method to Japan, Belgium, Okinawa, Cairo, and other distant markets.

Missouri Pacific RR also operates a container or demountable body service. Equipment includes 32-ft. dry van type containers (179); 32-ft. open top containers (20); 37-ft. dry van types (30); and 37-ft. van type mechanically refrigerated units (150). Meat rails are installed in 35 of the latter units.

Entire body can be lifted via gantry crane from a highway truck chassis and placed on a specially constructed "cradle" car for rail movement. Chassis is placed under container when interchanged with other railroads and is moved as conventional piggyback.

MoPac's containers can and do handle any and all commodities that can be transported in semi-trailers, including foods.

TOFCEE Service

The Baltimore and Ohio RR uses much the same container equipment as MoPac so that containers or demountable bodies are interchangeable between these carriers as well as several others such as the Reading, CNJ, and Southern Railway.

With its TOFCEE piggyback service (Trailer on Flat Car), B & O handles items from perishable products such as meat, butter, lard, etc., to canned goods, and cartoned goods such as cookies and crackers. Piggyback trailer is as much a type of containerization as is the demountable body or van container.

Special piggyback terminals are now being built and a combined effort of six truck lines and Erie-Lackawanna RR is significant. Some $2 million will be spent for terminals on E-L property at Chicago and Jersey City.

And REA Express, active for some time in piggyback operations, recently developed with Erie-Lackawanna, "the nation's first daily movement of piggyback trailers in long distance coach and sleeper passenger trains."

Still more recently, REA unveiled a new rail car (Pullman Standard) designed and specially built to handle interchangeable shipping containers of all sizes. Car was initially demonstrated with 16 side-loaded steel containers manufactured by Trailmobile. Each unit measured 5 x 8 x 8 ft. but the car also permits intermixed handling of 8 x 8 ft. containers in 10-ft. modular lengths up to 40 ft.

Early this year, REA also demonstrated an 85-ft. General American Transportation piggy-back car that could carry twenty 4 x 8 x 8-ft. magnesium containers (Fruehauf) or mixed combinations of containers on racks. Regular 20- and 40-ft. containers or truck trailers can also be transported on the 70-ton load capacity car.

Small magnesium containers are easily loaded and unloaded by one man. Other features include a reduction in handling of individual shipments at terminals and in express cars; pre-assorting of shipments into individual containers according to destination; sealed protection of shipments; and reduction in split-lot deliveries.

REA system also allows shippers to load small modular-sized containers with whatever goods desired and have the entire sealed unit moved intact to desired destination. Food and beverage shipping is limited since REA's small containers are not, as yet, insulated or refrigerated.

Truckers, of course, are quite active in containerized handling. Take Central Truck Lines, Tampa, Fla., for example.

Central's standard dimensions for containers are: Length—5 ft. 6 in.; width—3 ft. 6 in.; height—5 ft. 3½ in. With these units, Central has shipped goods for John Sexton & Co., Crown Candy, Whitman Candy, Coca-Cola syrup, Canada Dry, Topp Cola, National Nu-Grape, etc.

Central points to cheaper and speedier delivery as main benefits to shippers. System prevents secondary handling of multi-piece shipments.

Freight forwarders are playing a significant role in container service. For example, ABC Co., N.Y.C., provides service to eight cities from New York to Chicago, all on the B&O.

Fishy-Back, Too

Matson Navigation Co., San Francisco, provides extensive containerized service between Los Angeles, San Francisco, and Honolulu.

Service was inaugurated in '58 when 20 containers were loaded on deck of a Matson C-3 vessel. During '60, operations were expanded to a level where more than 1,000 containers monthly were loaded westbound to Hawaii.

Currently, nine Matson freighters carry containers. Of these, the largest is the Hawaiian Citizen, an all-containership having a capacity of 408 units, including 72 spaces for reefer containers. Two C-4 vessels, the California and the Hawaiian, can lift 246 containers with 44 reefer spaces. Remaining six C-3's weather decks have been modified to carry 75 containers and one of the six also carries eight reefers.

The two C-4 freighters are actually dual purpose container and bulk sugar carriers. The 633-ft. long vessels are capable of handling 16,400 tons of sugar eastbound from Hawaii to the Pacific Coast.

"Container yards" in San Francisco, Los Angeles, Stockton, and Honolulu are used to assemble or hold containers for loading to or discharging from a vessel. Each yard is equipped with necessary transfer, repair, and maintenance components.

Four basic containers were de-

veloped by Matson:

1. **Dry cargo container.** Outside dimensions are 24 ft. x 8 ft. x 6½ in. with a capacity of 1,415 cu. ft.

2. **Refrigerated cargo container.** Outside dimensions are same as dry cargo with only slightly less cubic feet.

3. **Refrigerated containers** with meat rails and hooks for "hung" products.

4. **Ventilated containers** for food cargoes that do not require refrigeration but do require air.

Food and beverage firms using Matson's container service include: Sunshine Biscuit Co., Cudahy Packing, C & H Sugar Refining Co., California Packing Corp. and Dole Corp.

According to Matson officials, the "door-to-door" transportation concept has virtually eliminated cargo damage and pilferage. Rates are also lower, generally. And shippers may use domestic packaging, i.e., package goods as domestic cargo and not as ocean freight, another cost reduction.

Safe cargo factor is, of course, a major boon to shippers because even though the carrier is normally responsible for any damage to shipped cargo, the administrative costs of processing claims to any larger shipper of damaged cargo is quite substantial. Moreover, there's no need to reorder goods that have been damaged.

American President Line, San Francisco, is another shipping line with an active containerization program. Early this year, APL awarded a $1,250,000 contract to Fruehauf for production of 420 box-shaped, aluminum containers.

Containers will be known as Twin-20's because of a design that allows two to be locked together to operate over the highways as a single 40-ft. truck-trailer.

Under its integrated transportation system, APL plans to use common-carrier truckers, private operators and railroads for movement of containers to the West Coast, from where its own cargoliners will transport shipments to the Far East.

A run-through of recent APL manifests shows that the following foodstuffs have been moving in containers: Dried fruit, canned goods, fruit cocktail, pickles, peaches, coffee, wine, candy, cocoa, salad dressing, meat, and many other items.

East Coast Interchange

At the other side of the nation, giant **McLean's Sea-Land Service** provides six self-loading trailerships for a continuous, cost-saving ocean link between highway systems of the Northeast, Florida, Texas, and Puerto Rico.

Some 4,000 giant 35-ft. trailer units serve as safe, secure shipping containers for goods of every conceivable kind, straight through from shipper to consignee. Sea-Land points out savings in rates, time, packing and marking, handling, pilferage, and damage losses.

Gantry cranes, carried by each trailership, are used to lift the trailer units. Ships carry 226 of these units and can load and unload in 12 hr. In unloading, trailers are placed on waiting chassis and immediately dispatched to consignees.

The U. S. Federal Maritime Board is weighing a plan for containerized service between the Chesapeake Bay area and Western Europe. Proposal, fostered by Atlantic Express Lines of America, has created considerable interest in shipping circles.

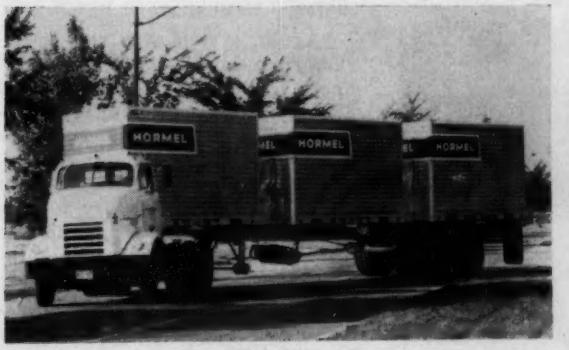
Other major carriers such as U. S. Lines, American Hawaiian, Olympic Griffith and Grace have made significant strides in containerization. But the problem of standardization is critical, although Grace Line's Seatainer service to South America has been tied up by Venezuelan labor organizations, too.

As Waldemar Isbrandtsen, of Isbrandtsen Steamship Lines, points out, pioneers of containerized shipping have not gotten together on standards with each other or with land carriers, and urged early adoption of standard-size containers by his industry. He recommended a standard length of 10 ft. based on experience with the 100 containers now being used on Isbrandtsen ships.

Container Transport International v.-p. Jerome Slater believes that steamship lines should consider the pooling of all containers. CTI owns about 4,000 containers which it leases to all classes of users through Container Leasing Corp.

Recently, firm inaugurated a warehouse-to-warehouse container coordinated plan whereby shipper and motor carrier can load flatbed trucks with several small containers and deliver each less-than-trailer-load unit at each of its distribution plants without sacrificing speed or holding up other distributors.

Units can be reloaded onto a lo-



CONTAINER SYSTEM pioneered by Hormel indicates what can be accomplished via containerization. Packed at Austin, Minn., containers travel three per Clark-Brown flatbed trailer to local delivery trucks for still-sealed distribution to store. Containers with folding, recessed legs (Morhaul) are used for Hormel shipments to West Coast markets.

cal delivery truck and delivered in assigned lots to each of the local retailers within that distribution area without risking extra handling charges. Motor carrier can then either pick up the empty container on his return trip or carry back to the origin point miscellaneous freight or unacceptable merchandise.

And Birdy-Back

American Airlines' aluminum Bunyan Box and United's Air-Pak, with dimensions of 84 x 63 x 42-in., are prime containers for air shipping. Mounted on eight roller bearing coaster wheels, unit has a hinged door running full length which can be locked and sealed for weatherproofing.

Peaches, strawberries and other perishables are speeded to East Coast points via Bunyan from California and Texas packing areas. Benefits include temperature control, unitization, safety from handling damage, lower handling costs, and sealed delivery.

Each Air-Pak will hold approximately 162 crates of strawberries or 212 crates of raspberries. Dry ice provides refrigeration.

Container used by the Flying Tiger Line is a collapsible aluminum type which can be built up from a minimum height of 2 ft. to a maximum of 6 ft. and can carry up to 3,000 lb. of prepacked, chilled fruit or other similar perishables.

Aluminum sections 14 ft. tall are interlocked and constructed into the rigid, solid box. Collapsed, the box can be reduced to about 2 ft. in height, with the metal sides stowed inside for return.

Box is delivered in collapsed state to shipper, who erects the sides, packs the box, chills it, and turns it over to the carrier. A portable dolly is attached to the box to permit easy transfer by hand even when fully loaded.

Primary reason for air-shipping perishables, according to Flying Tiger's George Zettler, is speed of market delivery. Hence, it brings a premium price. However, cost is such that a large volume has not been developed. Only a small group will pay the premium and then only on the initial crop, such as first-of-season strawberries.

Food Industry Reaction

Topic of containerization is almost unknown in its workings and applications to many food and beverage manufacturing executives. To others, who have tasted of its benefits, it is something that must be looked forward to with optimism and anticipation, although caution is advised by all.

For this special analysis, the first of its kind, FOOD Engineering surveyed distribution, transportation, and administrative personnel in several leading firms to find out just how containerization is affecting and will affect the food and beverage industry.

General Foods has used Flexi-Van service extensively on domestic shipments of coffee and frozen juice concentrates. In addition, shipments to Puerto Rico and Hawaii via Sea-Land and Matson have also proven successful.

According to J. Harold Wright, manager of transportation development, advantages accruing are reductions in transportation and handling costs. "But the biggest problem to be overcome," says Wright, "is a closer working arrangement between different modes of transportation and standardization.

"Continued progress in containerization," he adds, "will require intermode cooperation in solving problems common to the entire transportation industry. Its future is limited only to the degree that self-preservation of separate transportation modes becomes the objective as opposed to overall coordination of a collective transportation effort. The needs of each industry are different and a great deal of work remains to be done before any of the expected advantages of containerization can be fully realized."

Swift & Co. has participated in several attempts to utilize the container system of handling. First experience was in '57 when the Rock Island RR furnished Swift with two containers refrigerated with dry ice and engineered to handle meats. Containers were shipped on flat cars from Missouri River plants to Chicago and then lifted via fork truck onto trailer chassis for delivery direct to customers.

"We found this method of handling very satisfactory," reports H. P. Simpsen, assistant general traffic manager, "but were unable to continue it since railroad was not willing to meet truck rates. We are not in a position to absorb such a penalty."

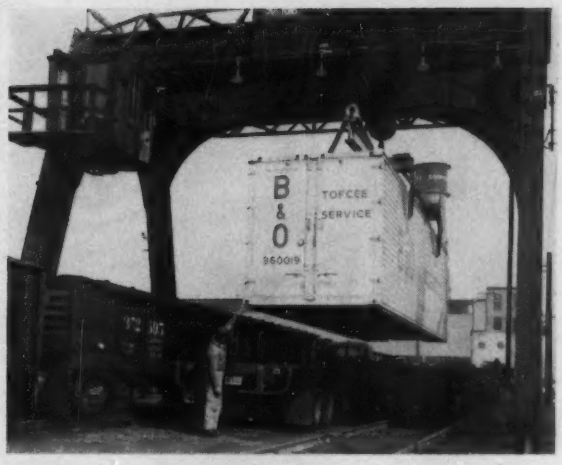
Later, Swift participated with American Car & Foundry in various tests — loading product at shipping plants in route order and transporting to East Coast destinations. Here, the three 17-ft. containers were lifted from flat car by overhead crane onto trailers and a drayman made direct delivery to customers.

"Again, system was very satisfactory and met with good acceptance by our customers," says Simpsen, "but a close analysis revealed that distribution costs were somewhat higher than our conventional methods of handling. In addition, it was necessary for the railroads to make a round-trip weekly with one set of containers. They were unable to do this consistently and, consequently, containers are not in use at the present time.

Swift has also used New York Central's Flexi-Van system. Cer-

ALL-CONTAINER CAR operated by REA Express can carry interchangeable, mixed units, with standardized 8 x 8-ft. containers from 5 to 40 ft. in length. Sixteen of the 5-ft. side-loaded units may actually be transported by REA.

ALUMINUM CONTAINERS for air freight shipment can hold over 2,000 lb. of perishable produce. United's Air-Pak and American's Bunyan Box are prime examples of birdy-back.



DEMOUNTABLE TRAILER is heart of TOFC service offered by such carriers as the B&O. Refrigerated units, 36x8x8 ft., are transferred between rail and truck via gantry cranes.

tain piggy-back arrangements, such as Plan III, are also of interest to Swift and they are utilizing these methods of shipping. (See panel on Five Piggy-Back Plans.)

Looking to the future, Swift feels that, "Eventually, containerized shipping will be in more general use than at present. And we would like to see both rail and truck carriers supply containers of various sizes."

Aside from elimination of re-handling, Swift points up a development that may take a big bite out of the food processor's high distribution cost. This is a system whereby containers of various sizes may be dropped at large supermarkets and serve as a cooler. Store personnel could then work directly from the containers.

Fulfill a Need

Armour & Co. looks at containerization as the end result of "several recent developments attempting to fulfill a great need in the transportation industry to overcome the high cost of product or merchandise handling and re-handling."

Firm views containerization as similar to that of unitization and palletization in efforts to eliminate piece handling. But with containerization, "the individual units are of several sizes, all substantially larger and heavier than the pallet load. Consequently, proportionately greater gains may be expected."

"Extensive handling from a rail car to a truck and then unloading at the customer's dock can be eliminated," says Armour, adding, "a rail car shipment can be broken into two, three, four or five containers, loaded on a flat car at the shipping plant, and unloaded onto delivery trucks at destination. In turn a container may be left at the customer's platform or dock.

"The expense of tying up equipment and a driver for transfer is taken out of the total cost of transportation. When these savings are passed on to the shipper, they most likely will more than offset the allowance that he may have to give a customer to unload his own container shipment upon arrival. There are also other tremendous gains such as protection from damage, pilferage, and the elements."

Freight claims are very costly. In '59, claims for fresh fruits, except citrus, were $15.524/car prorated on basis of all cars shipped during the year. Citrus was $10.612/car; melons $79.398; fresh vegetables $17.663; frozen foods $18.565; and meat and poultry, fresh and cured, $8.065 — all in-transit damage.

Armour intends to use containers for export of meat products to Hawaii and Puerto Rico, as well as the East Coast, to avoid some of the disadvantages of present handling methods and also "to enjoy a reduction in transportation costs."

Meat packer believes containers should be owned by the railroads, truck lines, or steamship lines who would acquire them instead of replacing existing equipment.

In addition, Armour points to the development of jet freighter planes that can improve air freight business and narrow the rate structure. From this, "it is possible that transit time vs. cost may bring new customer-supplier relationships into play and cause a change in the relative importance of these factors."

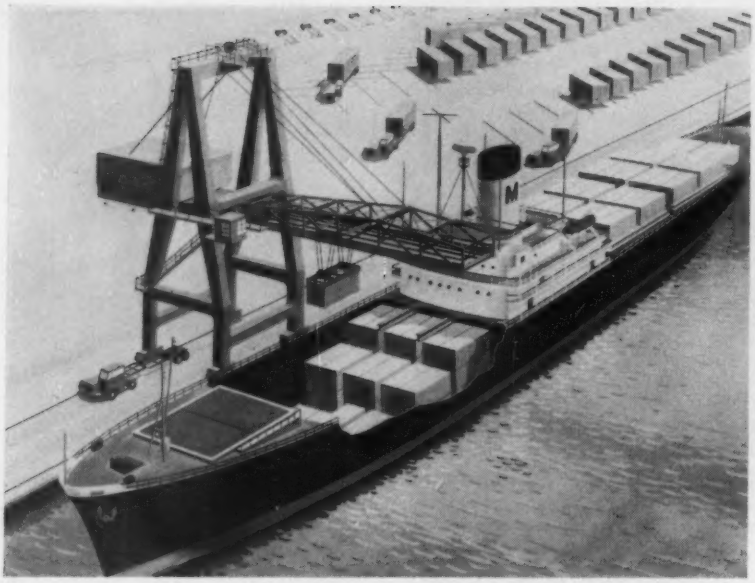
"Therefore," officials emphasize, "it would seem best to remain flexible and adopt a common shipping container for the carload and truckload shipper that can also be used for air freight when the need may arise to expedite delivery."

For Certain Freight

Wilson & Co. has conducted unitized container shipping at a number of its plants for some time and are well pleased with the results. But Wilson's general traffic manager, Evan Girton, predicts that, "While this method of shipping will become increasingly important for certain kinds of shipments, it will not generally replace conventional methods."

Wilson's Albert Lea and Omaha plants use Flexi-Van for some shipments to Eastern cities. Its Cedar Rapids plant is using the Illinois Central piggy-back semi-trailers for some shipments to New Orleans, and the Los Angeles plant utilizes Matson container trailers for shipments to the Honolulu branch.

Aside from reduced shipping costs, traffic chief Girton points to more uniform temperature control in LCL shipments and less



CUTAWAY SECTION of Matson's all-containership, Hawaiian Citizen, illustrates some of the 408 containers ship can transport between Honolulu and West Coast ports. Vans are brought from yard to gantry crane for placement aboard ship.

product handling from plant to destination as other advantages.

He emphasizes the need for containers of different sizes for shipment of frozen foods at sub-zero temperatures. He sees interchangeable shipping containers as a desirable and practical reality in the not too distant future.

Containerization progress at Carnation Co. has been essentially in connection with movements to Hawaii and Puerto Rico, plus a very limited use of piggy-back. Carnation's California plant lends itself to the Matson program which "has reduced our transportation costs," according to A. P. Davis, Jr., Carnation's general traffic manager.

Pointing to the various forms of piggy-backing as a rivalry between truck and rail, Davis believes this competition will result in "an invigorated transportation system." But he does not believe that containerization, piggy-backing, etc., "is the panacea for all that is wrong in the transportation industry. There are tremendous benefits to the freight consolidator, for example, by containerizing shipments of various kinds. To some degree this will benefit the food industry provided the freight forwarder is able to reflect the lower operating costs in his freight rates."

The Carnation executive emphasizes that "We have an obligation to see that our products are delivered to the consumer at the lowest possible cost. In some instances, containerization or unitization is a means to this end. In others, it definitely is not. I also believe there are other ways to reduce our distribution costs since we are primarily a carload shipper. As to new techniques of shipping, I do not believe that we can expect a complete revolution in the next few years."

Davis believes there is an "opportunity for the railroads, through their piggy-back operations, to considerably improve service." He points out that "a large number of food manufacturers who ship by rail must ship in stopover cars and this delays arrival dates. By loading two containers on a flat car, one container could be taken off at an intermediate destination and trucked to the customer while the other went immediately to its final point."

Traffic expert sees the "lack of an adequate rate structure" as one of the reasons why Carnation is not too enthusiastic about piggybacking. "We have found in most cases that railroad piggy-back service is not as good as truck service because of the delays in waiting around at terminals for trains to be made up, distance from ramp location, etc. A truck can be loaded at our plant and dispatched immediately."

"In most instances," he reports, "railroads are charging the same as the truck-line for piggy-back service and I do not expect to pay premium transportation charges for less than premium service. If the rate structure were developed to three levels, namely rail carload, piggy-back, and truck, shippers and receivers would have a proper choice based on their requirements."

Know the Facts

Davis does feel that "containerization has great possibilities. But if its development is to be economically sound, it must be thoroughly thought out and no one should make heavy investments in this type of carriage without all the facts. Containerization and unitization, if not properly studied, can result in increased costs—the antithesis of what we are seeking."

Canada Dry Pres. Roy W. Moore, Jr., does not believe containerization will have an appreciable effect on his firm's day-to-day business, at least with the present mode of delivery.

"The vast majority of our products will continue to be distributed to the many retail outlets by our fleet of delivery trucks operating throughout the nation. The combination of products, size, and volume would make containerization of individual orders not feasible."

But Canada Dry does manage to incorporate the benefits of containerization into a part of its operation. In one instance, where certain products were centrally produced, Sea-Land was used on a 40,000-lb. beverage shipment to Florida. Transit time via land or sea were roughly equal but the water rate was lower.

More recently, Canada Dry used Flexi-Van to ship centrally produced products over long distances. According to Moore, "this enabled us to do a comparable job more economically."

Concerning the future, the soft drink executive would be interested in seeing "the necessary uniformity in containerization equipment, standards, and procedures brought about which would permit free and interchangeable use of containerization techniques between all modes of transportation. Some of the containers already developed appear to be primarily for the use of and with other specific carriers and types, and are not useable with other important systems."

Frank Armour, Jr., H. J. Heinz Co. president, believes the benefits that containerization will confer on his firm are, roughly, the same as will affect the whole industry: Reduction of pickup and delivery costs, and to an extent, reduction of manufacturing costs.

"Since our company has such a strong international orientation," he adds, "and since the benefits of containerization increase in proportion to the distance of shipment and to the number of modes of shipping used, it seems that over the long period, it will benefit us perhaps more than it will all industry."

"Once containerization gets to the point of successful shipment back and forth of materials and products, it may well reach the further point of enabling us to hold containers of raw materials in manufacturing areas while we gradually use the materials in processing."

"For example, it would be of advantage to us if we could receive a standard container of spices and permit it to stand in our processing area while we dispensed spices. We would have to pay a part of the container cost, but this would ultimately work out to be a saving over the present system of transferring spices to our own container-dispenser."

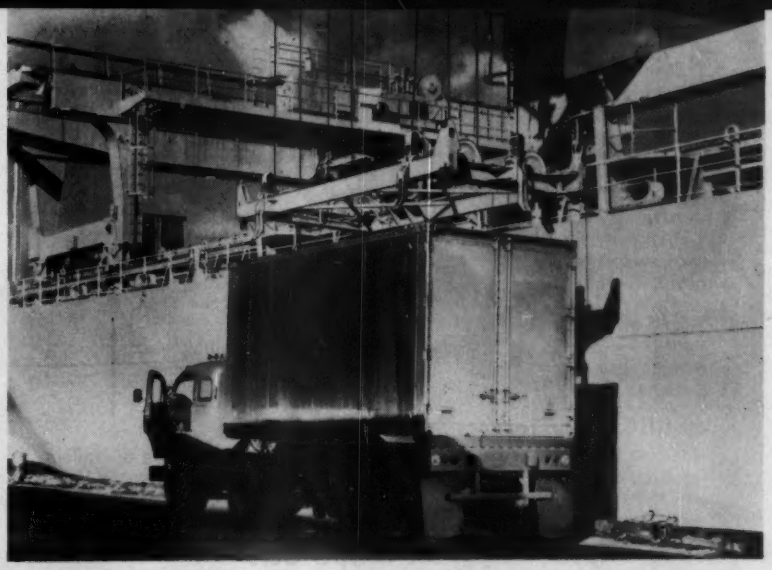
Relatively, Heinz has made considerable progress in containerized shipping. But the chief executive emphasizes that "containerization must develop on an interdependent basis in the industry. It is really the mutual adoption of standard procedures to reduce our steadily mounting transportation and distribution costs."

Grant Horsey, knowledgeable president of Salada-Shirriff-Horsey, feels that "containerization must make large advances before it becomes a significant part of our company's operations."

He points to "uniformity of containers and better refrigeration facilities" as two requirements needed to increase the importance of containerization. Development of an inexpensive collapsible container is mentioned as a hoped-for improvement.

Only Carriers Gain?

I. C. Blair, of firm's Canadian Div., points to another problem. The economies developed so far by the use of containers, he says, "favor the carriers, in the main. They are able to use equipment more efficiently. Therefore, it seems logical to us that the carriers should provide, maintain, and carry the empty containers. They have been unwilling to do this."



TRUCK-TO-SHIP transfer begins fishy-back operation. Spreader engages and disengages container's top corner castings by manipulation of lanyard. Containers are fastened to weather decks and to each other by Speedloader fittings.

Like Heinz' Frank Armour, S-S-H sees export shipping as a more fruitful area for containerization because of the increased dangers of damage and pilferage. But difficulty again is how to use the container economically on the return trip. If there is no return cargo, or if the container is not collapsible, the original savings are cancelled out.

J. A. Zoet, Horsey Div., Plant City, Fla., emphasizes need for refrigeration improvements of canned and frozen citrus juices. "Containerization," he says, "has resulted in somewhat lower shipping rates when used, but has not altered our transportation operations."

Speaking for the company's Salada-Junket Div., which produces tea and desserts, David White reported that both piggy-back and fishy-back containerization has been used to a limited extent. "For the time being," says White, "the system could not be regarded as a major factor in our transport picture."

In general, firm feels "the food industry would not accept containerization for delivery of finished products on a large scale until certain improvements are developed. There is one exception—long distance hauling of small, high-priced packages."

Dole Corp., according to Pres. H. C. Cornuelle, ships palletized loads of pineapple products in Matson containers direct from its Honolulu plant to customer warehouses in the San Francisco and Los Angeles areas. "Matson restricts forwarding of the container beyond these port areas," says Dole executive, "otherwise we would send the container to inland destinations."

Firm would like to see standardization and joint financing of containers. This, in their opinion, would expedite integration of the three principal modes of transportation.

Popular Matson service is paying off in dollars and cents savings for many who use it. One example is the Dairymen's Assn., Ltd., a subsidiary of Beatrice Foods Co.

Merchandise shipped in containers is butter, skim powder, and general cargo. Reason for shipping these particular commodities, according to firm's Harry Kondo, "is because we felt this is the area where the biggest savings could be realized."

Kondo points to these specific savings via containerized service: butter—$.0013/lb.; skim powder—.0068/lb.; whey powder—.0056/lb.

And one good thing about con-

Five Basic Plans for Piggy-Back

Plan I: Railroads & Motor Carriers

Carriage by railroad of trailers of common carrier truckers at either a flat charge per trailer or a "division" of the rate. It is a "substituted" service performed by the railroad for the trucker, who solicits the business and bills the shipper.

Plan II: A Railroad Operation

Railroad performs all of the service, including furnishing trailer, loading and unloading, pick-up and delivery. Railroad solicits business and bills the shipper.

Plan III: Shipper Trailers & Rail Cars

Railroad furnishes flatcar and provides loading and unloading of trailers, while shippers handle pick-up and delivery. Ramp-to-ramp rates made for these shipper trailers (owned or leased) are based on commodity and quantity moved, or at a flat per-trailer charge.

Plan IV: Shipper Trailers and Shipper Cars

Railroad furnishes only power and rails for shippers who not only furnish both flatcar and trailers, but perform all loading, unloading, and pick-up and delivery service. Flat charge per car is made for not exceeding two trailers, whether loaded or empty.

Plan V: Truck-Rail-Truck; Joint Rates

In effect, rates extend territory of each carrier into that served by the other, permitting each to handle shipments originating in or destined for the other's territory. Each may sell for the other.

tainers," says Kondo, "is that even if you don't save money on freight cost, at least you will have less pilferage and damage from re-handling."

Other leading food firms such as Borden, California Packing, Oscar Mayer, Standard Brands, and Libby, McNeill and Libby reported limited contact with containerization. Problem of standardization of both containers and equipment is paramount. But, as C. S. Decker, Borden's general traffic manager, puts it, "the future and its problems of cost, quick turn over, etc., will supply the demand for standardization. Business ingenuity and the experience now being gained will supply the know how. Therefore, I think the future of containerization is bright but the road to ideal attainment is crooked and rough."

One particularly attractive potential for containerization mentioned by several industry people lies in the movement of grocery products to wholesale and chain grocers, and subsequent delivery to food stores.

According to W. H. Gribble, Pillsbury, "containerization has made relatively little progress in this field thus far but is a subject of great interest." Currently, the idea is being explored through the medium of unitized shipping and Gribble feels that "progress must be made in the area of integrated materials handling systems before any significant progress can occur in the use of special boxcar or truck equipment."

Pillsbury approaches this type of handling with the idea that such a system "must be sufficiently flexible as to conform with customers' buying habits. Gribble notes that the "multiplicity of systems in use in customer warehouses is very perplexing and thus far we have made no significant progress in making unitized shipments to our trade. We are actively pursuing this project and are optimistic about the result but the problem can only be solved through cooperative work between wholesaler-chain and manufacturer."

Gribble points to substantial savings via this system, in use at Pillsbury's warehouses. "We have more than doubled the productivity in the unloading process. Significant savings have been made in loading costs through application of the same method which we call 'cube.' We have demonstrated that similar savings can be made in unloading at customers' warehouses. We believe that relatively simple modifications could make the system compatible for a large segment of the trade."

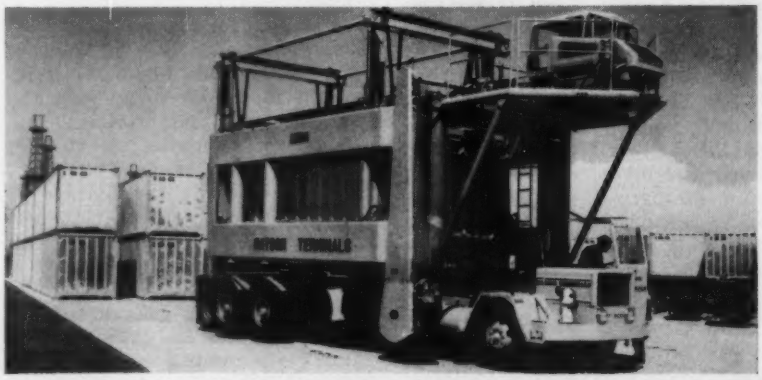
Caution & Action

Theme of a need for standardization is obvious from all reports by these key food industry executives. And the MH-5 Committee is speeding further recommendations along for approval following acceptance of its initial sizes.

From here on in, the food manufacturer must consider standards to integrate his own needs and techniques of distribution into the overall pattern of containerization. He must work closely with equipment suppliers as well as with other industry leaders to get the full benefit of this new development.

He must guard against premature standards and systems that may, in the long run, be less flexible than conventional shipping methods. He must not get caught with investments in equipment that don't really fit his needs. Perhaps leasing experiments may even be indicated.

In effect, containerization can be a big boost to the shipper's distribution effort. But he must act in his own behalf and dictate caution along the way. (End)



VAN CARRIER in use at Matson's container yards handles vans "end-wise" as a straddle carrier and can also stack and lift as a lift truck. Several materials handling suppliers are developing various types of container transfer equipment.

ON CALL TO THE PROCESSING INDUSTRIES

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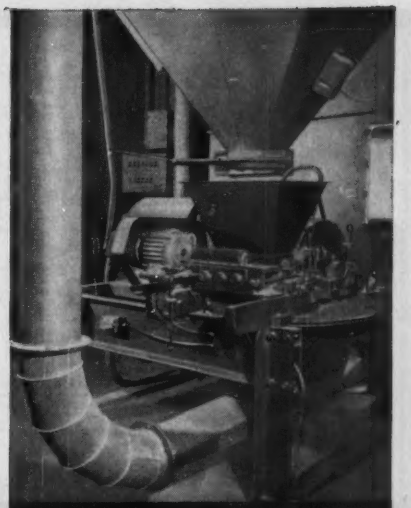

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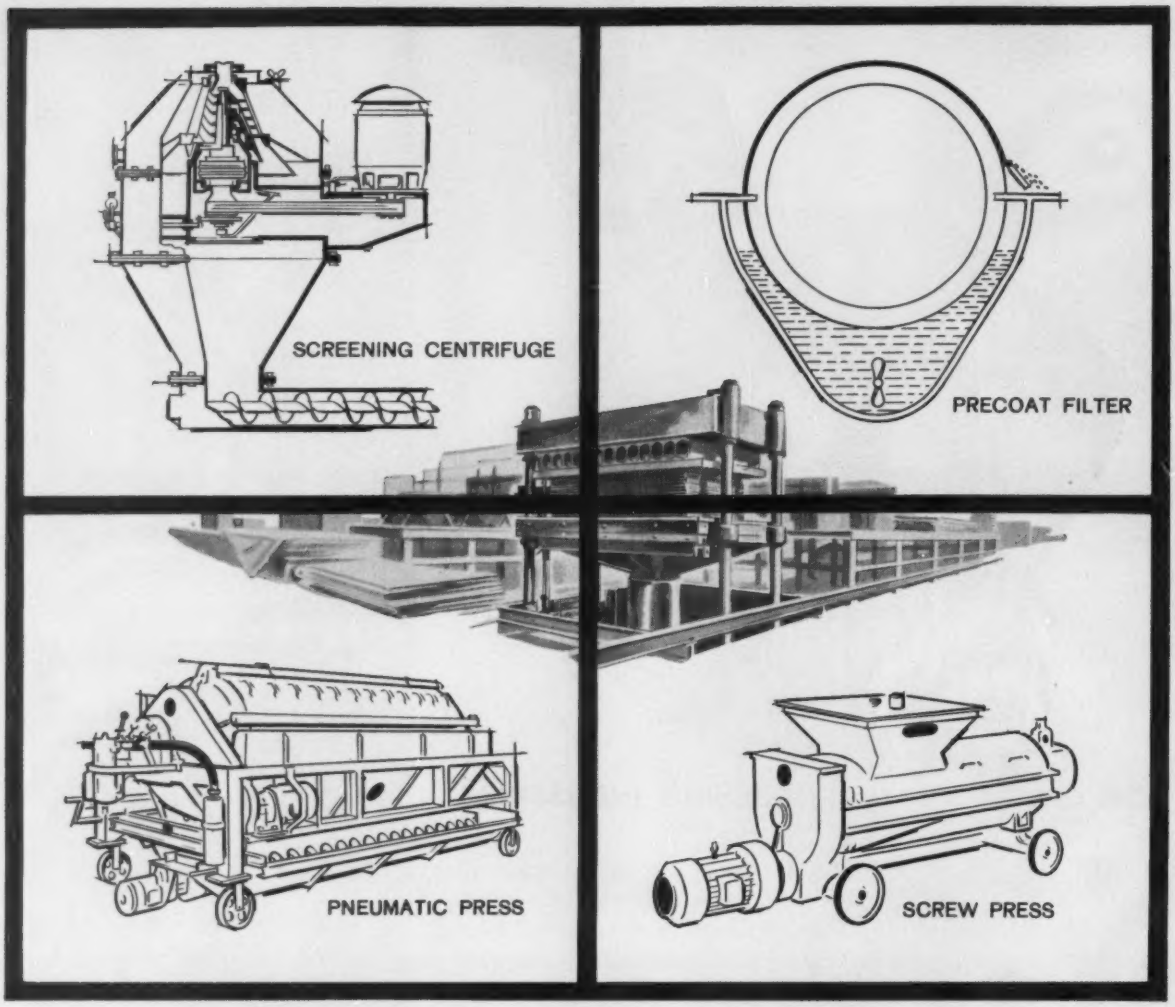

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Marketing Signals

Cold cereals warm up . . .

New product test ahead

. . . Mass feeding 'bigness'

Fast Getaway Into '61

Despite the recession, first quarter sales of food companies surged 15% ahead of last year's levels, according to a tabulation by FOOD Engineering. However, profit margins thinned a little bit more as earnings perked up only 4%. Profit gains were carved out by the packaged goods, soft drink, brewing, and confectionery segments.

That this impressive gain was limited to larger companies is suggested by Commerce Dept. reports that food-beverage mfrs.' sales for first quarter were up a mere 1.2%. Food stores did better, up 3.9%.

Non-Food Outlets More Competitive

Latest confirmation of non-food outlets' growing food business comes from Super Market Institute. In '60, SMI reports, 25% of member stores felt "severe competition" from this source, as against 9% in '58. Discount houses were cited most frequently, followed by military commissaries, farmers markets, freezer plans, and variety stores.

Other highlights of SMI's poll: (1) Sales rose 8%, primarily on the strength of increased tonnage. (2) Frozen foods averaged 4.5% of sales vs. 4% in '56. (3) Non-foods represented 5.4% of sales compared to 5% in '56.

Cereal Bowl Gets Bigger

Hottest item on the breakfast table in recent years have been ready-to-eat cereals. Sales shot up 57% between '54 and '60—from $260 to $490 mill.—and the number of national brands climbed from 40 to 52. Cold versions now represent nearly two-thirds of all breakfast cereal consumption as against 50% in '39.

And the trend will continue in the future, Quaker Oats believes. That company's prediction: Ready-to-eat volume will total 1.3 billion lbs. by '70 (compared to 800 mill. lbs. in '55). **USDA, too, sees future cereals consumption helped by two factors—1) intake doesn't decrease as income rises, and 2) low-calorie emphasis hasn't blunted product's appeal.**

Pointed Advice on New Products

Realities of shelf space will force processors to develop new products "with a higher degree of certainty and in a less helter-skelter manner." So warns Pres. W. B. Murphy, Campbell Soup. He told the Western Assn. of Food Chains that the increase in number of items a store carries (from 4,000 to 8,000 in 10 yrs.) "can't continue forever and will force processors and distributors to use more care in the selection of items."

He said that a check with two large distributors showed that 100 new grocery items are offered them each week, that 25 are chosen, and, furthermore, that only 6 survive the introductory phase. Coat-tail-riding and me-tooism were cited by Mr. Murphy as the principal causes of new product failure.

New Trends in Mass Feeding Field

Although there's almost universal agreement on the future growth of the institutional market, there's a wide difference of opinion on what can be done to reduce the field's high costs of selling. Speaking before the U. S. Wholesale Grocers Assn., Norman E. Bess, executive vice pres. of the Institutional Food Mfrs. Assn., warned that "the food service industry is inevitably headed toward 'bigness' as a sheer matter of survival."

One result of this trend, he observes, is the **development of food service operator co-operative buying groups with mass purchasing power.** A second offshoot, he predicts, will be "co-operative broker arrangements in certain markets with more work by food brokers at the user level."

BRIEFS

Chain merchandising of candy is swinging from grocery shelf to horizontal-type displays, observes National Confectioners Assn.

Small-size tomato juice cans are a big need in the vending field, according to S. J. Davin, Stange Co.

Gerber's foreign expansion accelerates: Firm made arrangements to have baby foods produced and marketed in Japan by Meida-Ya, a giant combine that includes bakeries, canneries, breweries, bottlers, and distribution centers.

Gourmet-type items can bring super $1500 a week gross, with 33% profit margin, Vita Foods estimates.

Disposable packages (cans or throw-away bottles) will dominate the soft drink field inside of 3 yrs., predicts Pres. Walter S. Mack of C & C Super Cola.

Capitalizing on increased demand for poly-unsaturated oils, Pacific Vegetable Oil will debut line of safflower-based items (salad and cooking oil, mayonnaise, French dressing, margarine).

Profitable food products "GET-propelled"

Fast-moving food items get their sales speed from satisfied customers who keep coming back for more. Helping processors of fine foods improve flavor and texture has been CLINTON's business since before the invention of the shopping cart. More than 50 years of experience with products from corn is working on your side when you specify CLINTON CORN SYRUP, CORN STARCH, REFINED CORN OIL, LACTIC ACID and CLINTOSE BRAND DEXTROSE.

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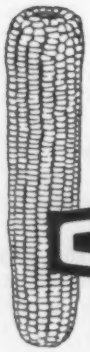

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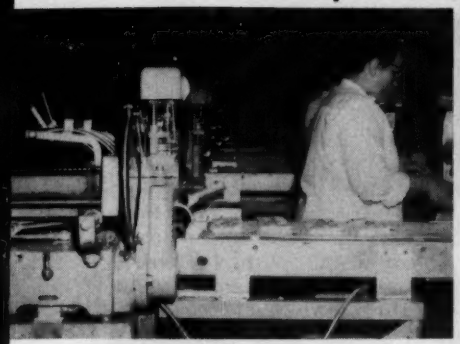
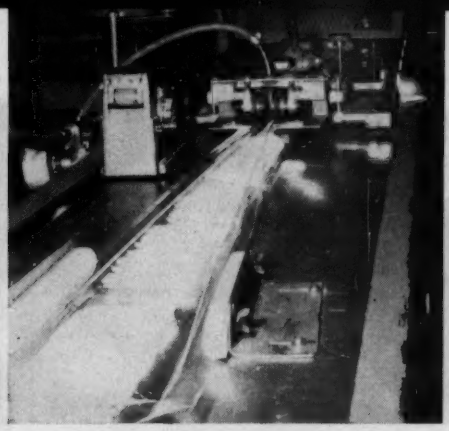
3 Steps in . . .



SLICE IT: Battery of machines cut, interleave, and stack pre-set number of cheese slices for checkweighing.



WRAP IT: New machine forms film (from roll stock) around product, gas-purges package, fabricates pouch.

. . . Armour's System

PACK IT: Pouches are cased twelve to a carton, four cartons to a shipper, at specially designed loading station.

Bag-Packing Goes Automatic

Straight-through pouch packer helps Armour eliminate manual handling of cheese slices. Unit doubles output, prunes film costs, is adaptable for other products

ONE-BY-ONE, hard-to-handle products that must be packaged by hand are giving way to machine advances. Latest case in point is cheese slices—commonly inserted manually into pre-formed pouches, then hand-fed to sealing units.

Now, Armour & Co. has found a better way. Key is a new straight-through machine (Haysen) that is without reciprocating parts. Unit forms, from roll-fed polyethylene-coated cellophane stock, a side- and double-end-sealed pouch around conveyed stacks of cheese slices. Because pouch is formed around the product stacks, pre-formed bags aren't needed.

Multi-Benefits Realized

What have been the results? Here they are:

. . . **Better price advantage.** Company no longer need purchase pre-formed pouches, saves ½¢ per package on material costs.

. . . **Higher production rates.** Line now handles 55 units/min. vs. 20-24 under old set-up.

. . . **Fewer handlings.** Eliminated are the storing, handling and inserting (manually) of cheese into pouches, which had to be picked up and fed to heat-sealers. Production-line workers now devote their time to checkweighing and cartoning packages.

. . . **Smarter appearance.** Slices are packed more snuggly into pouches, thus eliminating dogear ends.

. . . **Greater space-saving.** For one, pouches take up less space, hence require less paperboard in construction of cartons and master shipping container. For another, three pouches can be store-displayed in space formerly required by two of the older 4-side sealed pouches.

. . . **Speedier size changing.** New machine doesn't require change parts to switch from one size package to another. Conveyor is done by switching roll stock for controlling width of pouch size and by simple hand-wheel adjustments for pouch's length and height.

. . . **More product-handling flexibility.** In addition to packaging cheese slices, Armour is also using the new machine for Swiss cheese chunks (random weights around 12 oz.).

While Armour uses the new machine for cheese, unit can also be employed for packaging sliced bacon and luncheon meats, candy bars, stacked cookies, etc.

Blocks of cheese are fed one at a time to four slicing machines that are pre-set to cut (with circular knife) 6 or 8 layers, interleave (using roll-fed stock), and stack. Blower keeps knife-cut parchment sheets horizontal to each falling slice.

Stacked slices are then conveyed to a transverse belt, over which are mounted a battery of Shadograph checkweighing scales (Exact Weight). Operators remove stacks from belt, check weigh them, add or remove slices to make up proper weight.

How New Unit Works

Cheese is intermittently transferred onto chain-driven conveyor with stainless steel flights traveling through horizontal type packaging machine. During this transfer, product is automatically positioned onto a sheet of roll-fed polyethylene-coated cellophane.

Electric eye length-registration, employed with printed target on film, permits machine to handle various size cheese. Width adjustment is made by switching over to roll-fed material of varying widths.

As film is pulled toward back sealer, package is gas-purged with

FE Staff

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nitrogen—from a pressure cylinder (70 psi.) through tubing flanged at end. Teflon plows fold film over cheese so side fold passes under back-sealing iron. Finger wheel adjustment controls height of package by raising or lowering back-seal assembly.

Cheese, now enclosed in folded sleeve, is guided by two pairs of rubber rolls to rotating end-sealing drum (containing nine pairs of sealing jaws). Photo electric eye triggers heating bars to grip drum, and jaws clamp package and advance film as it continues around drum. In one operation, jaws seal bottom of first pouch and top of second one. Sealing jaws hold package as both follow drum to discharge conveyor where cut package is released.

After sealing cycle is completed, jaws accumulate in open position along rotating drum. Each set of jaws then waits its turn to resume sealing operation. After drum slips by resting jaws, electric eye control releases set of sealing jaws. However, as drum moves, upper jaw is "cammed down" over lower one to cut, at the same time, the sealed end.

Machine employs resistance-type heaters for regular heat-sealing film. Impulse-sealing type units for unsupported polyethylene and other plastics are also available.

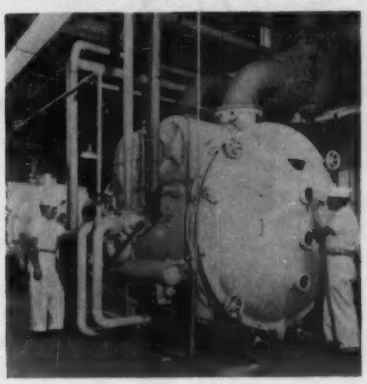
Pouch drops onto stainless steel chute and then onto rubber-cleated take-away belt. From here, rotating disk transfers packages onto an inclined rubber-cleated belt feeding the packing station.

To facilitate carton packing, Armour designed three plywood-type carton-forming and closing stations. Each station comprises a 4-sides plywood box for hand-forming cartons with a pair of vertical plywood sheets for flap closing. (End)

"Got any olives?"

COMPLETE chicken stew is one of six meals that campers can now easily prepare from new Armour freeze-dried mixes.

FREEZE DRYERS made by Atlas Co., Denmark, turn out the new foods.



Armour Introduces

Freeze-Dried Meals

Initially for campers, this line of meats, stews, and eggs could open the door to mass distribution of freeze-drieds. Prime factors are quality and cost

ARMOUR & CO. has underscored its confidence in freeze-dried foods by pioneering a line initially for camping and outdoor use.

Called "Star Lite," the foods have only 16-33% of original weight, and can be reconstituted and cooked in 5-30 min. The current group includes beef steaks, boneless pork chops, ham-patty mix, beef and chicken stews, rice and chicken dinner, and cooked scrambled eggs. Packaged in two- and four-person servings, foods will be distributed through sporting-goods stores and mail-order outlets.

Typical suggested retail prices for the foods:

Combination dinners—$0.50 per serving (8-9 oz.).

Steaks—$1.10 per serving (7-8 oz.).

Eggs—$0.55 (6-7 oz.).

Admittedly, campers will find special advantages in these items—light weight, safe storage without refrigeration, and ease of preparation. However, Armour is betting on much wider consumer acceptance.

Thus, the company plans to test market freeze-dried shrimp, meat cuts, and various meat and vegetable combinations in conventional channels this fall.

According to Armour, the foods retain the taste, texture, and eye-appeal of their fresh counterparts with little if any change in nutritive value. And they can be stored for 1-2 yr. without refrigeration.

The freeze-dried products have less than 2% moisture. To guard them against the deteriorating effects of oxygen, moisture, and light, they are packaged in a triple-film laminate and in nitrogen atmosphere.

Production is underway at Armour's new research and processing plant in Bellwood, Ill. Atlas equipment is used and plant capacity is described as adequate for the immediate market. As distribution expands, Armour is prepared to locate freeze-drying plants anywhere.

How Far, How Fast?

Armour's move gives a variety of freeze-dried foods their first major test. The military has been purchasing substantial quantities, but it has special interests and requirements. United Fruit & Food Corp., San Carlos, Tex. (formerly Liana, Inc.), has just bought a large Stokes freeze-drying plant to expand its shrimp output.

Whether or not these foods have the high quality required for mass distribution is controversial. Obviously, Armour feels that its line qualifies now, while research in product and process improvement continues.

Cost, then, is the major factor. It is reasonable to assume that Armour would not be at this stage unless it expected a favorable cost situation in the near future at the latest. Savings in transportation and storage costs apparently will be supplemented by lower-cost processing.

Meanwhile, the freeze-drieds will have some inherent consumer prejudices to overcome. Despite the success of certain dehydrates, the fact is that this type of food has not enjoyed wide consumer acceptance.

The unfamiliar and somewhat unattractive appearance of unreconstituted freeze-dried foods is not an asset. This factor, plus certain preservation criteria, preclude the use of transparent packaging. Yet, the average consumer prefers to see what she buys—especially with meats.

Although the degree of rehydration of freeze-dried items may, in general, be satisfactory, researchers are quite concerned with some foods' water-holding property. If imbibed water is easily squeezed out of meat or chicken during chewing, the product appears unnaturally dry. And this effect is more evident the longer the food is stored. **(FE Staff)**

Special Handling Problems?

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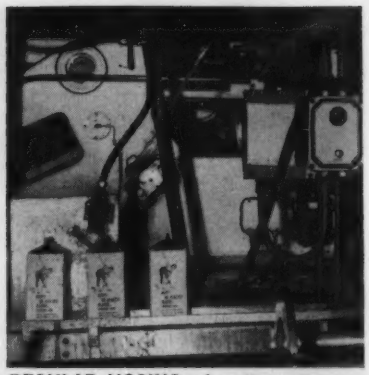
PROXIMITY SENSOR (arrow) triggers a remote counter every time a carton pushes metal flapper up toward sensor.



REGULAR HOSING of carton conveyor drenches sealed sensor, yet does not impair its operation.

Sensor Solves Counting Problem

Sealed proximity switch senses conveyed objects, triggers remote counter . . . Withstands regular hosing, too

TWO MINNEAPOLIS DAIRIES—Fairmont Foods and Clover Leaf—now get accurate counts of milk cartons moving along a conveyor. A correct count of filled cartons and incoming gallonage is a must for cost accounting.

The problem: To find a counting device that wouldn't fail under the conditions of high humidity and condensation that prevail on filling lines.

The solution: A three-element system engineered by Honeywell's Micro Switch Div., Freeport, Ill. It consists of a conveyor mounted, sealed proximity switch that senses the cartons without physical contact; a remote relay amplifier, and a mechanical counter triggered by the amplifier.

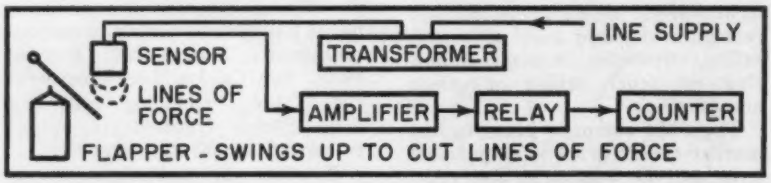
Heart of the system is the sealed switch, whose operation is detailed below. Having no moving parts, it can be used in damp areas without any problems of internal condensation. In fact it even operates under water, so regular hosings with steam or hot water won't affect it.

System in Action

At Fairmont Foods, a metal flapper was fastened to the top of the conveyor. As a carton moves along the conveyor, it pushes the flapper up toward the sensor, which actuates the remote amplifier and counter. The flapper responds fast enough for accurate counting at the conveyor's relatively low speed (25-78 cartons/min.). As for the proximity sensor, it can count up to 700 items/min.

The setup at Clover Leaf is similar, except that a rod and vane replace the flapper. In this arrangement, the carton bottom triggers the sensor. As a carton strikes the rod, the vane swings across the face of the sensor.

(End)



HOW COUNTER OPERATES: The switch sensor works on Wheatstone bridge principle. Metal flapper used here is the magnetic device that triggers sensor when pushed up by a moving carton. A signal to amplifier then trips relay to operate counter.

A **Y Globe** that challenges comparison shows it pays to

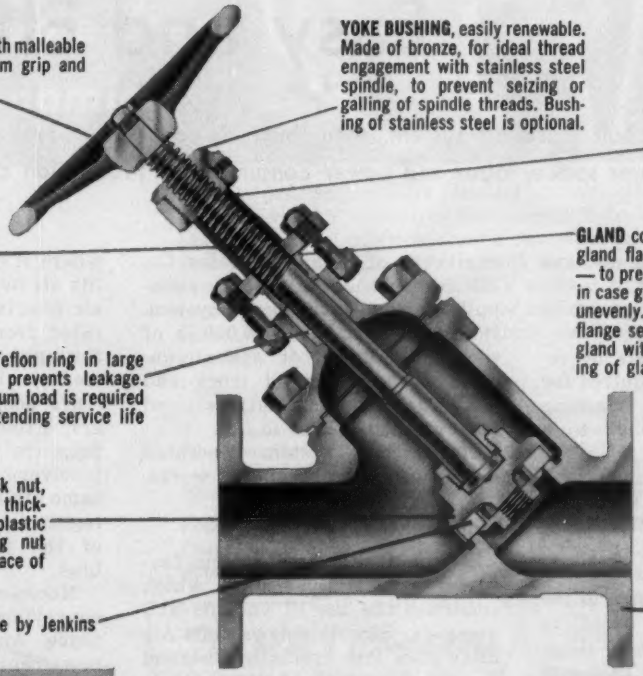
Specify JENKINS for STAINLESS STEEL Valves, too

Want the "best buy" in Stainless Steel Y Globe Valves? Compare this Jenkins Fig. 1335 with any on the market. You'll conclude that it's hard to beat Jenkins at making valves, no matter what the material.

You'll find genuine superiority of design and construction in the features shown here. But no picture can show the quality of the castings . . . the precision machining . . . the rigid inspection and testing that have gone into this valve. All of these are as important as design and metal alloys in assuring long, dependable, economical valve service. And, all of them are up to the peak standards for which Jenkins has been known for almost a century.

SEND FOR NEW CATALOG of Jenkins Stainless Steel Valves, in patterns and alloys that satisfy the requirements of practically all corrosive services.

These Jenkins Valves meet valve industry specifications and the high standards established by leading users of stainless steel valves.



WHEEL of high strength malleable iron designed for firm grip and easy operation.

SPINDLE of large diameter and dense structure has high resistance to wear and torsion strains. Easy, tight closing is assured by long, precision machined thread bearing surfaces. A beveled shoulder provides backseating against inside of bonnet, permitting repacking under pressure.

PACKING A Teflon ring in large packing box prevents leakage. Only a minimum load is required on gland, extending service life of packing.

DISC HOLDER, held by lock nut, has depth equal to disc thickness, preventing flow of plastic disc. Wide disc retaining nut covers all but seating surface of Teflon disc.

DISC is Teflon made by Jenkins

YOKE BUSHING, easily renewable. Made of bronze, for ideal thread engagement with stainless steel spindle, to prevent seizing or galling of spindle threads. Bushing of stainless steel is optional.

YOKE BONNET, a single unit, has liberal space between yoke arms for easy access to packing box. Tongue and groove joint with body makes a pressure-tight seal with less tightening on the bolts, and eliminates possibility of blowing out the Teflon gasket.

GLAND consists of two pieces — gland flange and gland follower — to prevent binding of follower in case gland bolts are tightened unevenly. Crowned surface of flange secures tightness against gland without excessive tightening of gland nuts.

BODY Through-port design for full, free flow. Liberal seat height permits repeated refacing. Cast on body are directional arrow and bosses for drain connections. End flanges conform to M.S.S. specifications.

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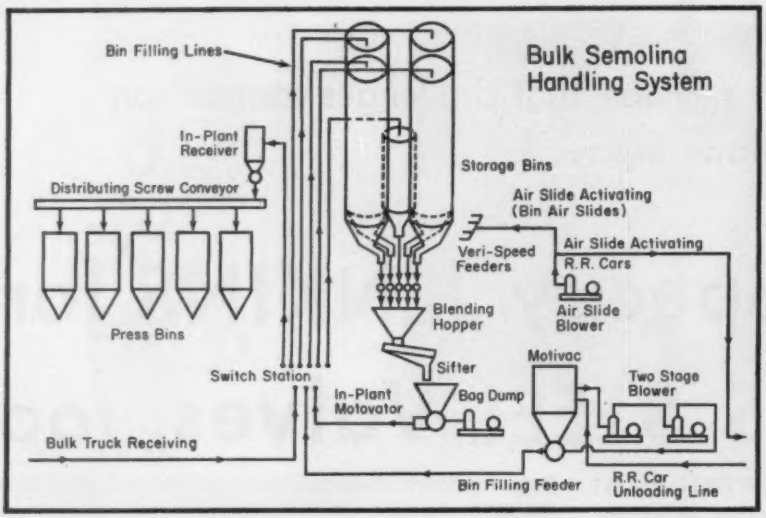


FULLY AUTOMATIC SYSTEM makes bulk handling easy. It unloads semolina from trucks, RR cars or even bags. Then, by vacuum - pressure system, fills pre-selected storage bins, from which product is blended for pneumatic and worm-screw delivery to pre-selected bins supplying macaroni presses at 200-lb/hr.

Bulk Handling Becomes Easy and Efficient

Compact bulk handling system, with built - in controls, saves macaroni manufacturer space, labor and power consumption. Production climbs, too

HOW WOULD YOU like to save each year:
. . . $19,000 on bulk shipment of incoming ingredients?
. . . $15,000 in labor costs by reducing a 5-man crew (required for bag unloading, in-plant handling and manual bag dumping) to a one-man operation?
. . . $11,000 on power consumption?
. . . $34,000 projected economy (gross less capital investment)?
. . . $23,000 net?

You can. Gioia Macaroni Co., Buffalo, N. Y., does—thanks to the advanced bulk semolina handling system (The Day Sales Co.) illustrated in flow diagram. This system automatically unloads carriers for bin storage, then blends semolina as mixture is conveyed to surge bins ahead of macaroni and spaghetti process.

Gioia engineers, working with engineers of The Day Sales Co. (Minneapolis), developed the push-pull (pressure-vacuum) system. It's designed to store 500,000 lb. of semolina (700 sq. ft. space), unload 30,000 lb./hr. (1 truck and 2 RR car unloading stations), and move in-plant 12,000 lb./hr.

Here's how system (operated from two control panels) works.

FE Staff

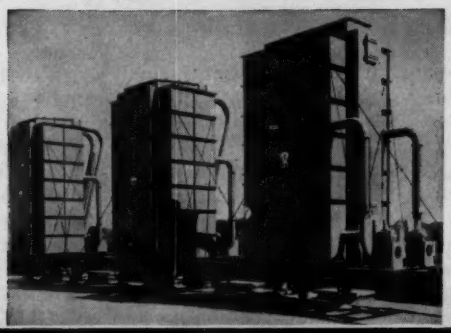
Unloading Operation

Railroad unloading system features Days Motivac unit, which combines the use of vacuum and pressure. Semolina flows from Air Slide cars into specially designed vacuum-type pick-up hoppers attached to RR car's discharge gate flanges. Both hoppers simultaneously discharge semolina into vacuum conveying lines to assure maximum efficiency (with varying product densities).

Semolina now is vacuum-conveyed to a pneumatic receiver (Day's heavy duty dust separator), where it's separated from conveying air by combined cycloning and air filtering. Clean air, after separated from semolina and passing through receiver's felt-filtering medium, is passed on to the system's positive displacement blowers. From here it's applied under pressure to pneumatic feeder at receiver-cone discharge. With the same air used for vacuum unloading, semolina is conveyed to any of the five pre-selected storage bins.

Motivac unit reduces vacuum conveying lines to a minimum distance. And conversion to pressure movement of semolina over the longer conveying lines assures greater efficiency and use of low horsepower.

To obtain best results with the Gioia installation, the Motivac is equipped with a two-stage positive displacement blower. Vacuum pressure on receiver is maintained at about —6 psi. Pressure between blowers is neutral, occa-



A battery of DAY "AC" dust filters located on the roof of a food plant processing starch. In addition, several "AC" filters are used within this plant. DAY equipment is also solving dust problems for many other dry foodstuffs manufacturers. Cake mixes, baking powder, cocoa, sugar, cereals, flour, powdered sugar, coffee, dried eggs and grain are some of the many other types of food products handled by DAY equipment. If your plant manufactures foodstuffs involving pulverized ingredients or dry products, be sure and check DAY for efficient, economical dust control.

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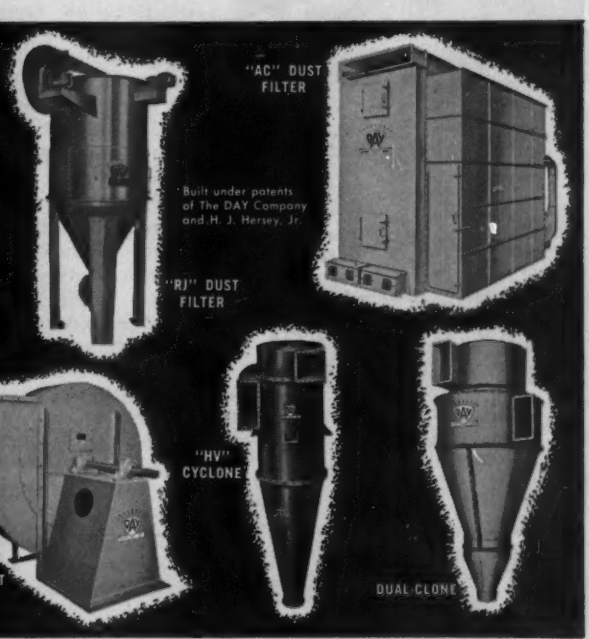

No two dust problems are identical . . . that's why it will pay you to consider DAY *engineered dust* control. Laboratory research, 80 years of practical experience and a *guaranteed approach* to efficient dust control are some of the reasons why companies of every size decide on DAY dust control. DAY offers a *complete* line of dust control equipment . . . seven types of collectors or filters — 166 different models . . . one is sure to solve your dust problem exactly, efficiently and economically.

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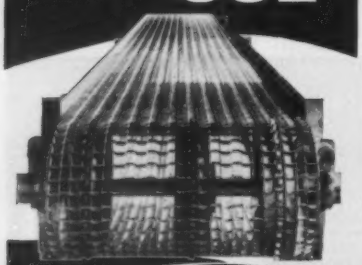
FLEXIBLE in USE



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The flexible open-mesh construction of LaPorte Belts makes them readily adaptable to a wide range of processing equipment in freezing, canning, dehydrating and pickling. It also permits the circulation of air and liquids around products in process and facilitates sterilizing with a steam gun while in motion. In addition, the open mesh assures a positive drive on the LaPorte Sprocket. These rugged, galvanized belts have uniform flexibility yet maintain a perfectly flat surface for containers, empty or filled.

If you process, package, store or ship food, it will pay you to use LaPorte Belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

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sionally going to the plus side. Conveying pressure at second-stage blower discharge is 9 psi. Total power consumption is 45 hp. Unloading rate is normally 50 tons/3 hr. Total conveying distance for unloading is 100 ft., with 25 on vacuum and 75 on pressure sides.

Plant is also equipped with two additional unloading stations. One permits direct bulk-truck receipt of semolina from nearby mills. Other is a bag-dump station to offer flexibility in the handling of emergency bag shipments as well as moving reclaimed product to reclaim bin and transfer of semolina from one storage bin to another.

Filling of storage bins is automatically controlled from a No. 1 panel (Square "D"), which contains a 4-way selector switch that's preset for bin to be filled from RR car, truck or bag-dump station. Unloading system won't operate unless selection is made and hose connection is completed with one of the bins filling tube at manual switching station. Air-Slide pump provides simultaneous Air-Slide Activating of RR cars and storage bins.

As further safeguards: Panel is also equipped with three pilot lights for each of the five storage bins to indicate "full," "half-full," and "empty" — and activated by level controls. Each bin's high-level control deactivates system when bin is full, and thus avoids plugged lines. Another control automatically operates bag dumping and filling of reclaim bin. When reclaimed product is dumped at bag-dump station, in-plant system is switched from conveying semolina (to any of five press bins) to moving reclaims (to reclaim bin).

In-Plant Conveying

Day's Motovator, a single-stage positive-displacement blower (20 hp.), conveys blended stock to receiver (at press bins' distributing screw conveyor) for storage of blended stock, or to storage bins for stock transfer. Conveying capacity's designed for 200 lb./min., for a total distance (to press bins) of 235 ft. through 4-in. dia. aluminum tubing at constant pressure of 6 psi.

Blending control panel (No. 2) has five sets of on-off switches and pilot lights. Variable-speed rotary valve feeders are dial pre-set to deliver proportionate amounts of semolina from as many as five storage bins to the blending hopper. Feeder blending range is designed for 200 lb./min. of a single product or collective blend of five. Dial settings offer a wide range of product blends, with minimum of a single product in a blend running about 3%. Additional blending is accomplished as semolinas move, in succession, through sifter, pneumatic conveying system and distributing screw conveyor mounted above press bins.

Controls (on panel No. 1) for five press bins indicate when bins must be filled. Then, sequence starters, timers, and relays provide automatic filling.

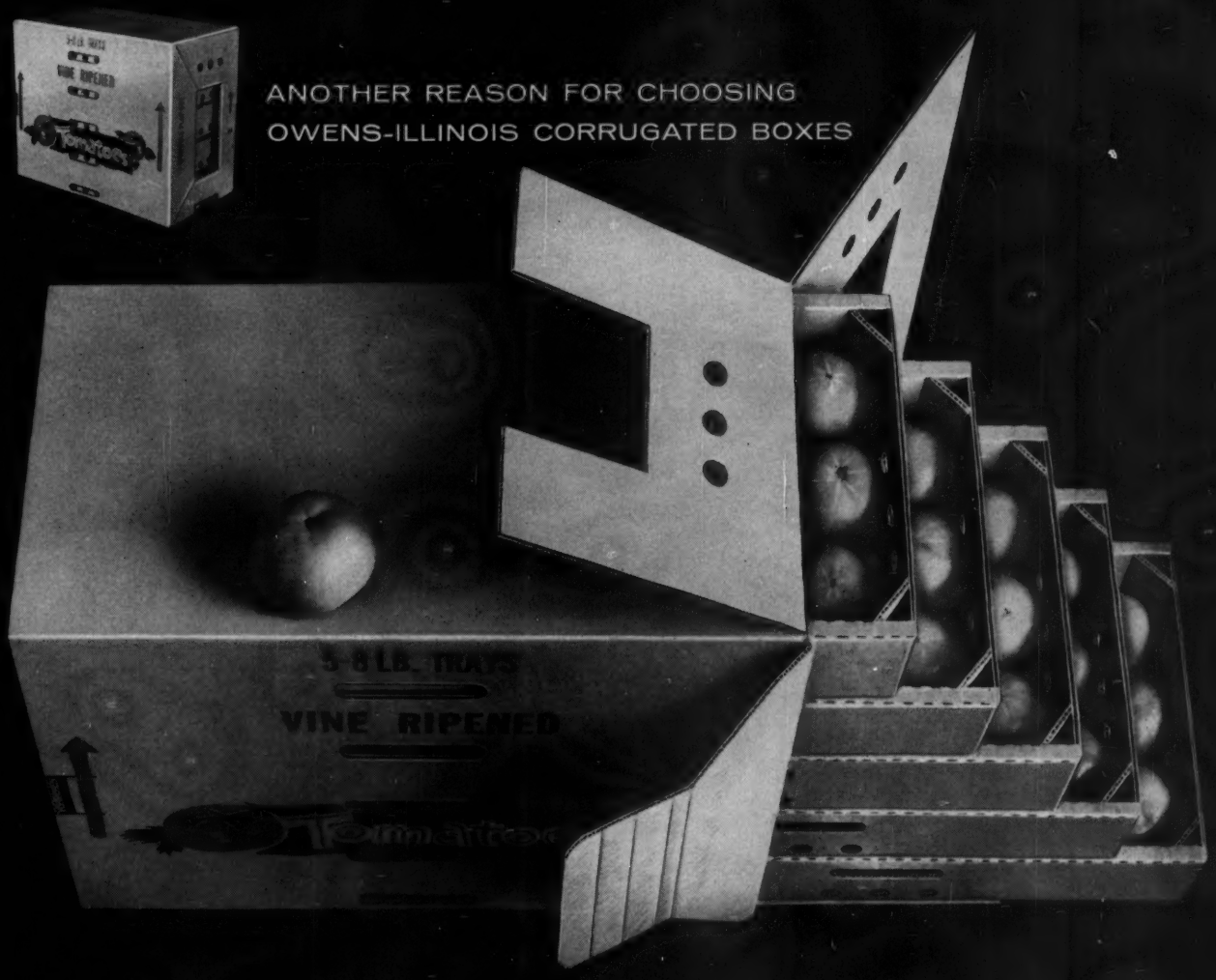
Press bin-filling control section on panel No. 1 contains five stations, one for each bin. Each station is equipped with start-stop button and three pilot lights. Start buttons can be engaged singularly or simultaneously in any arrangement (to five bins) for automatic filling of press bins. Stop-start system is necessary for purging on completion of filling each bin. And, upon completion of a bin-filling-selection cycle, system is reactivated by manual reselection.

Three level controls ("full," "half-full," and "empty") in each press bin trigger panel's pilot lights. High-level control also actuates shut-off sequence by stopping rotary blending feeders. Then, a 60-sec. purging cycle follows before the pneumatic conveying system, sifter, and distributing screw conveyor are automatically stopped.

All Air-Slide conveyors are activated by a single blower (10 hp.). Air line system, with valves to regulate and maintain pressure on individual slides, requires only the one blower to activate eight separate Air-Slides.

Entire pneumatic conveying systems require 14 electric motors, 5 on bulk car-unloading and 9 on in-plant sides. Motor power requirements are 48¼ hp. on unloading and 33 on in-plant sides. On each function of each system (unloading and in-plant sides), motor starter and controls are interlocked in event of motor failure or overload—as a precaution against plugged lines or equipment damage.

Acknowledgement: FE editors express appreciation to J. P. McMahon, The Day Sales Co., Minneapolis, for his cooperation in the preparation of this article.



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How Owens-Illinois corrugated boxes can cut handling costs as much as 80%

The Owens-Illinois concept of designing the right shipping box for the right job can benefit you—no matter what your product is.

The 5-Tray Produce Pack, above, cuts handling costs—in some cases as much as 80%. This is because local handling charges often are based on the *number* of boxes, *not* the size and weight. Here, five trays become one unit and each can be removed for product display without rehandling contents.

Because it's light, yet tough, the 5-Tray Produce Pack cuts shipping costs and gives ample product protection. Let us talk to you about how this *kind* of approach to *your* problem may yield the better answer.

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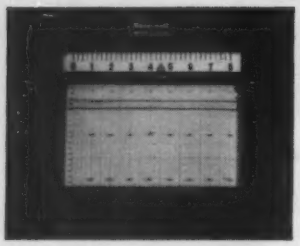

Honeywell complete food processing instrumentation

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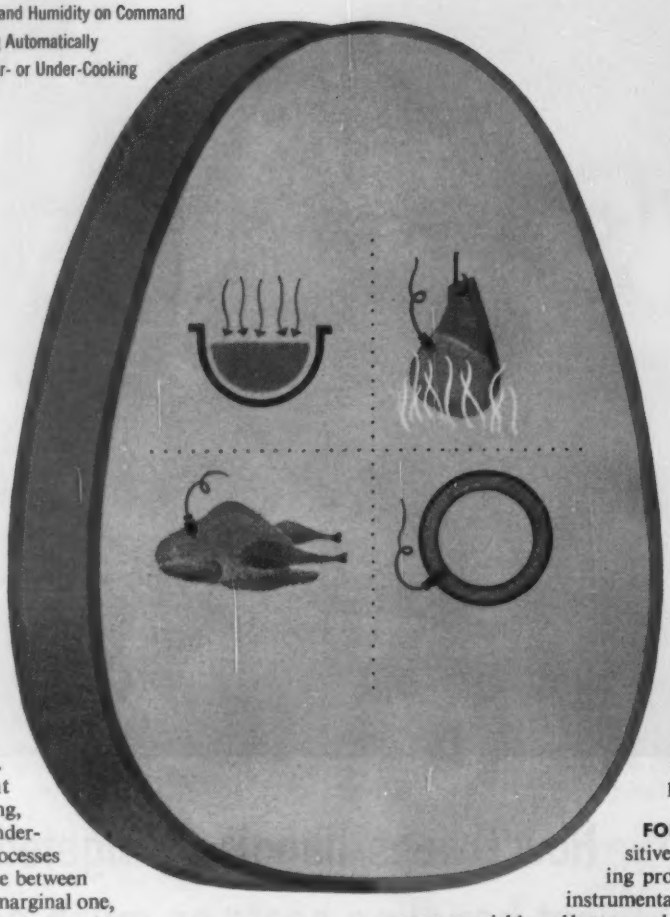

BRINGS OUT THE BEST IN YOUR MEAT PRODUCTS

Instruments are a meat packer's best friend! Properly designed and applied, they can bring new quality, new profits to all his meat products. Precise measurement and control of blending, smoking, roasting, rendering, and other meat processes can mean the difference between a healthy profit and a marginal one, or none at all.

With Honeywell instrumentation guiding the process, there's nothing left to chance. From the world's most complete line of automatic controls, Honeywell furnishes individual instruments and custom-designs complete systems to regulate virtually every meat processing operation.

FOR AUTOMATIC BLENDING. Honeywell Computer Blending Systems automatically control formulating of sausage, frankfurters, lunch meats, and other blended meat products. Basic mix formulas are solved in a matter of seconds and recorded on punch cards for programming the blending system to simultaneously and automatically blend all ingredients.

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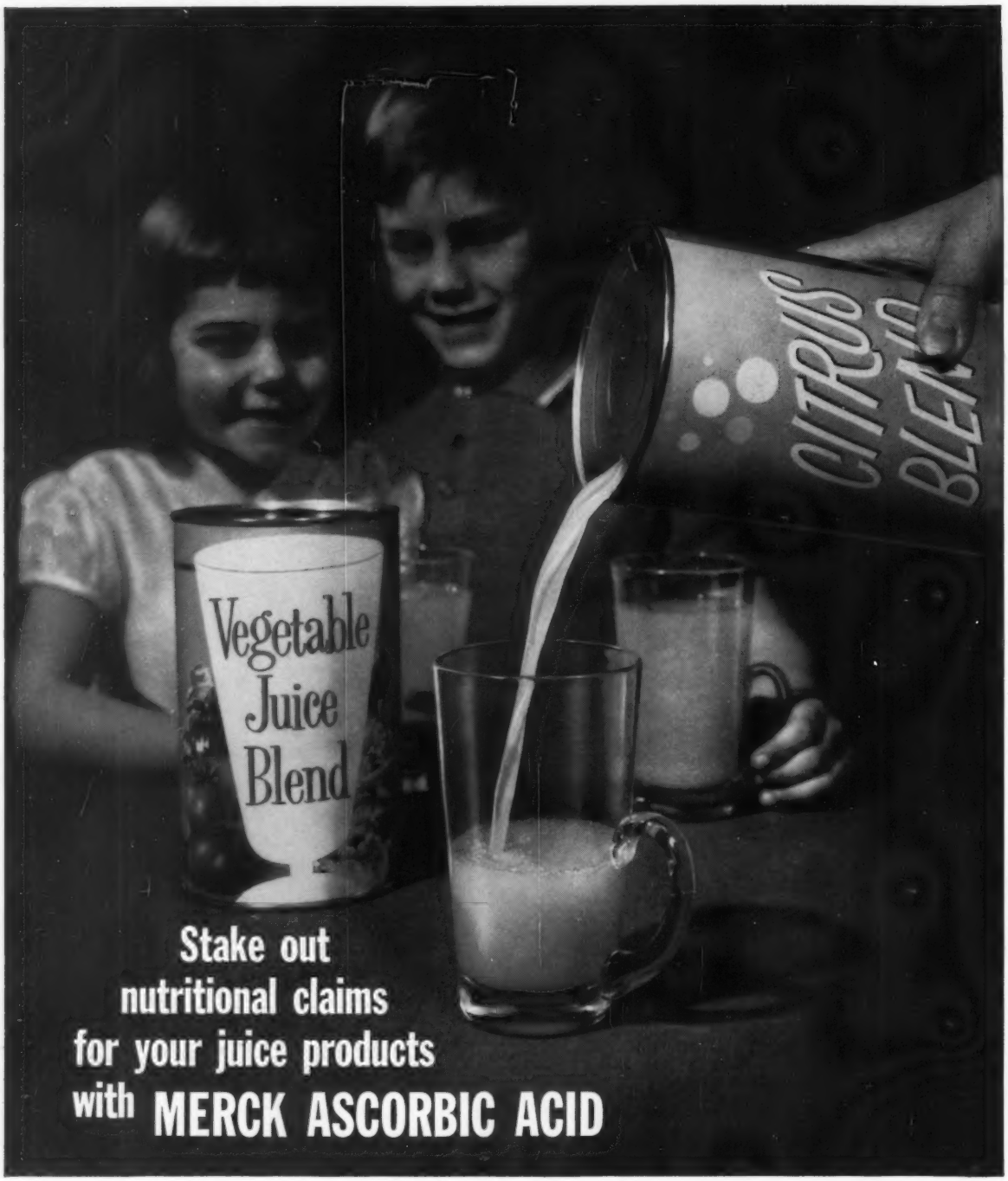

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Advances in Technology

British Study Effect of Various Factors on Storage of AFD Cod Steaks

In earlier work, the British Ministry of Agriculture, Fisheries and Food, Aberdeen, Scotland, studied the storage behavior of vacuum contact-plate dried (VCD) cod steaks. From this it was anticipated that the storage properties of cod dried by accelerated freeze-drying might differ from that of the VCD portions.

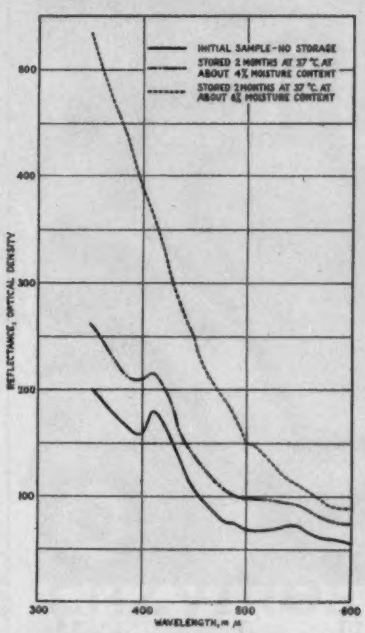
The AFD cod portions which suffer less heat damage than VCD are generally white in color and have a porous structure throughout. Reconstitution is very rapid taking only a few minutes compared with 1-2 hr. for VCD portions. The AFD steaks also have a better flavor and texture.

A storage test, therefore, was set up to study the effect of moisture content, temperature, and packing atmosphere on the shelf life of AFD cod steaks. Results show:

1. AFD cod steaks can be stored in air-packed sealed cans for about four months at 18C. (64F.), but only one month at 37C. (98F.) befor they become edible to a taste panel.

2. The extent to which nitrogen-packed AFD cod steaks deteriorated during storage at 37C. depends on the moisture content. An increase in moisture content from 2.05 to 2.87gm. H_2O/100gm. solids can result in the shelf life being reduced from 12 mo. to about four mo.

3. The shelf life of cod steaks is also dependent on storage temperature. At moisture content in the range of 2.3 to 3.5gm. H_2O/100gm. solids, increasing temperatures accelerate deterioration.—*Food Processing & Packaging (Br.)*, 123-127, April, 1961.



CURVES show the reflectance of AFD cod steaks which have been browned to different degrees during storage.

Vinegar Produced by Using Pure Cultures

Production of vinegar by the use of pure cultures of *Acetobacter* species is not usually practiced, but appears to have been successful in the Rajmaki Factory of the Finnish State Alcohol monopoly. The pure culture was isolated from shavings taken from an operating vinegar generator.

The isolating and cultivating medium was 5 deg. Balling malt wort containing 2.5% ethyl alcohol, and the organism was identified as *Acetobacter suboxydans* Kluyver and de Leeuw. Cultures were built up to about 60 liters in the laboratory before inoculating generators of 70 cu. meters (2650 cu. ft.; 18,400 gallons) capacity, packed with birch shavings.

The initial mash circulated over the inoculated shavings contained 3% acetic acid and 2% ethyl alcohol, together with nutrient salts $(NH_4)_2HPO_4$ and $MgSO_4$, and a commercial vinegar bacteria food, "Zymogen". Alcohol was added daily to the generator and it was about three weeks before the acid strength reached 10%.

An external heat exchanger controls the temperature within the generator. At the present time these generators produce vinegar of 10 to 11% acetic acid in 5 to 6 days with a daily increase of about 0.7% acid. The maximum strength ever obtained during the fifteen years of their operation was 14.3% acetic acid, reached in 10 days.—*Brauwissenschaft (Finn.)*. 95-98, 14(2), Feb. 1961.

Study of Microflora Within Healthy Tomatoes

Internal tissue of tomatoes, both green and ripe, frequently contains bacteria. By thoroughly washing tomatoes and immersing them in disinfecting solutions (15 min. in sodium hypochlorite, 300 ppm of available chlorine, followed by 30 min. in 80% alcohol containing 0.02% iodine), the external surface of the tomatoes was sterilized prior to aseptic sampling of the inner juice and pulp.

Dissection with a sterile knife or forcing an open-bore sterile pipette into the fruits provided samples of the pulp of the tomatoes aseptically. Examinations were made on 109 dates between Sept. 1958 and Feb. 1960 on tomatoes grown near Rehovot, Israel. In all, 1263 tomatoes were sampled, most of them of the Marmand variety.

About 40% of the tomatoes contained bacteria, and fruits without microorganisms were obtained on only 8 of the 109 days on which samples were taken. Bacteria occurred equally in green and red ripe fruits and the most common type was a motile rod of the genus *Xanthomonas*. A few *Pseudomonas* types also occurred. —*Applied Micrbiology*, 20-25, 9(1), 1961.

Pork Leanness and Moisture Content Related

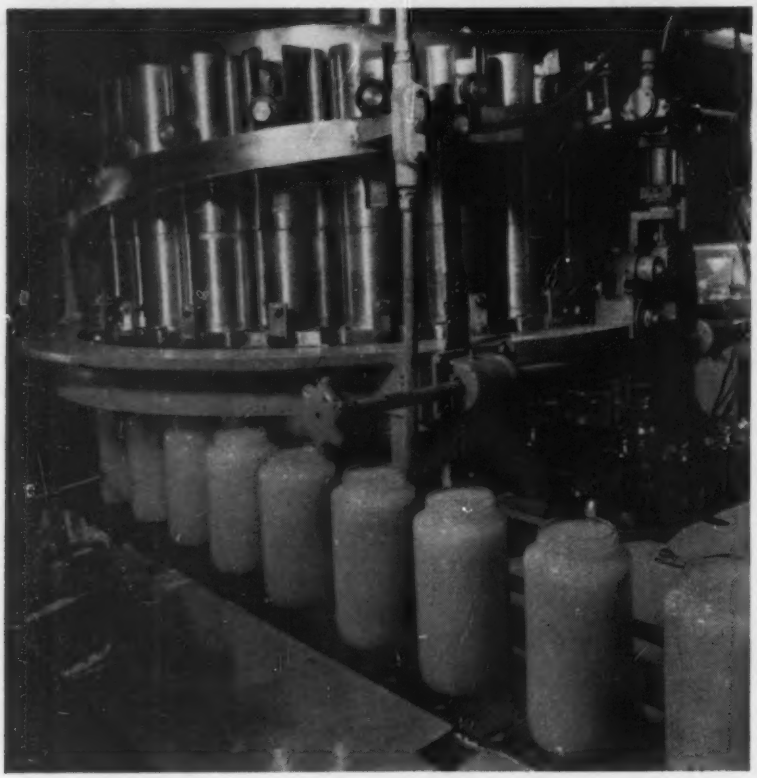
A correlation of the moisture content with leanness of pork has been established. The relationship is expressed by the equation:

$$L = 1.5\ M - 11.5$$

where L is the percent of lean and M is the percent of moisture.

The correlation is good for leaner cuts of pork, but percent error increases as leanness decreases. The equation is well applicable to lean contents higher

FLUIDICS* AT WORK



How to control "head space" *accurately,* every fill

Filling 190 quarts of applesauce per minute to ±1/10 fluid oz. is no problem with this Pfaudler® Rotary Piston Filler at Duffy-Mott. Always the right "head space" every fill.

In fact, most products you handle —from a spread like deviled ham to a lightly fluid evaporated milk—can be packaged to this precision with a Pfaudler filler.

What's behind such predictable and profitable accuracy? Simplicity in design—design that gives you the proper balance of smooth piston fit and small product "cushion." No surge. No leakage. No splashing.

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Design that keeps primary moving parts to just four—piston, valve roller, valve trip cam, and valve-lock wear pad.

Of course, it's also important to match port size and piston diameter to your product. But with the wide range of fillers available from Pfaudler, this presents *no* problem whatsoever.

Preventive maintenance is a final consideration. What to look for and when to act are spelled out in detail in a monograph entitled "Factors Affecting Accuracy of Vertical Piston Fillers." Written by a member of our Filler Product Engineering Department, it covers design, maintenance and process conditions.

For your copy, ask for Reprint 540. Address your inquiries to our Pfaudler Division, Dept. FE-61, Rochester 3, New York.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

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than 40%. It therefore can be used successfully for quality control purposes in the meat industry since commercial cuts of meat rarely contain less than 40% lean. —*Food Technology,* 8-10, Jan., 1961.

Iron in Wash-Water Causes Egg Spoilage

Rate and extent of egg spoilage is increased by washing eggs in water that contains a high concentration of iron—5 to 10 ppm. in solution.

U.S.D.A. research shows that wash water containing excess iron carries this iron through the shell and shell membrane into the inner egg tissue. Here, iron reverses the protective action of an egg's conalbumin—the iron-binding protein in egg white—and accelerates spoilage.

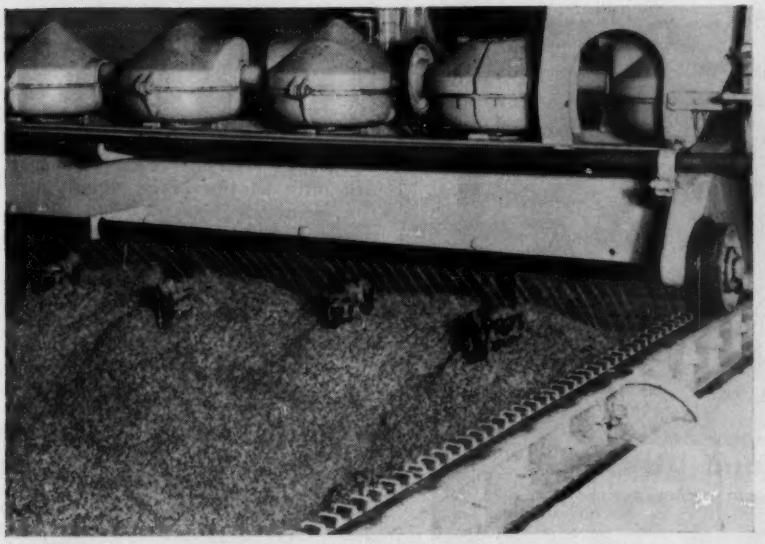
Earlier studies showed that conalbumin normally protects eggs from the *Pseudomonas* family of bacteria—common cause of spoilage. Conalbumin chemically binds normal amounts of naturally occurring iron, making it unavailable to these microorganisms which need iron for growth.—*U.S.D.A.,* Release May 1, 1961.

Colorimetric Method for Fat Acidity in Grain

Fat acidity in grain can be determined by a rapid colorimetric method. The method is based on the reaction of fatty acids in the benzene solution with aqueous cupric acetate to form soaps.

The copper soaps are soluble in the benzene solution and the intensity of the resulting solution's blue color is measured by a colorimeter. The intensity measured as percent transmittance is compared with fat acidity values expressed as the number of milligrams of KOH required to neutralize the free fatty acids in 100 gm. of dry grain.

For samples of wheat and corn the relationship between fat acidity values and percent transmittance is linear in the range of fat acidity values 20 to 100. The coefficient of correlation is −0.988 and −0.983, respectively, with standard deviations from regression of 2.47 and 3.42. The time required for the entire test is ten minutes. — *Cereal Chemistry,* 47-50, Jan., 1961.



GIBBERELLIC ACID, seen sprayed on barley malt during the early stages of germination, increases enzyme production.

What Is GA?

Gibberellic acid (GA) is a trace component (100 ppb.) of malt barley that stimulates plant growth. When added to the grain during steeping or germination, it produces better modified malts in a shorter time.

USDA developed the fermentation process by which GA is produced commercially. A selected strain of the fungus, **Fusarium moniliforme,** is grown in a submerged glucose — inorganic salts culture. GA is recovered by adsorption and extraction techniques.

Developing a suitable residual test method for GA was, of course, essential in getting FDA approval. Sharper GA checks are now possible through a sensitive fluorometric technique.

In this test, malt is: (1) Freed of interferences by buffered extraction, (2) separated by dialysis, (3) picked up by organic solvent extraction, (4) absorbed on inorganic-salt column, (5) eluted from column by another organic solvent, (6) evaporated to dryness, (7) dissolved in water, and (8) treated with sulfuric acid so the resulting fluorescence can be read directly by fluorometer.

Gibberellic Acid Spurs Enzymes

Potent plant-growth stimulant boosts malt's enzymatic activity, thus speeds starch conversion for brewers, bakers, etc. . . . Application to other crops cited

THERE'S WIDE INTEREST in a hot development in malting—the use of malts treated with gibberellic acid.

Called GA for short, the acid is a natural growth stimulant that accelerates the germination of barley malt, also increases enzyme activity, color, and soluble-protein content of the malt.

Brewers are investigating GA-treated malts as a means of cutting conversion time and increasing extract yield.

Flour millers are looking into the possibility of malt-containing flour blends, which would cut dough-fermentation time.

In fact, the new malts should interest anyone concerned with converting starches to sugars.

Currently, however, GA is considered a food additive in the production of malt. FDA has set a tolerance of 2 ppm. in the finished product. Thus, GA as such, or the treated malts may be used only in production of fermented malt beverages, distilled spirits, and animal feeds from by-products of these processes.

The new malt was developed by Rahr Malting Co., Manitowoc, Wis.

FE Staff

How GA Affects Malting

GA's principal function is to modify barley malt by greater elaboration of enzymes, such as alpha and beta amylases, proteases, and cellulases. It also reduces the fine-coarse grind difference in kilned malt.

Furthermore, the treatment increases overgrowth and berry size, makes the malt more mellow, and lowers bushel-weight yield.

Although the mechanisms by which GA operates are obscure, maltsters are quick to point out that this method of synthesizing enzymes can't substitute for the higher natural quality of malting barley.

Use of GA entails little change in malting operation. It can, if necessary, shorten germination time from 5 to 4 days.

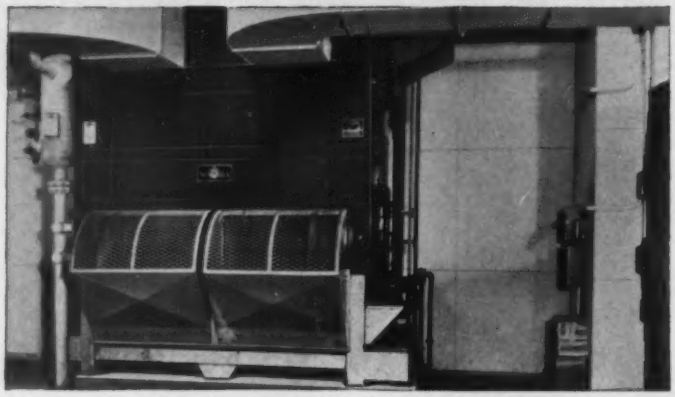
GA (or its potassium salt) in solution is added to barley malt either in the last steep-water stage or immediately after steeping. The latter is considered more efficient.

Looking to the future, maltsters see the possibility of higher yield with smaller investment. They are also checking the possibility of using GA in agricultural research to:

1. Initiate barley-seed germination for more rapid growth.

2. Produce seeds of one sex that might yield new varieties with

NIAGARA "no frost"



...DEPENDABLE and DURABLE

Experienced operating men will tell you that Niagara No-Frost refrigeration gives you the best results in food freezing, cold storage warehousing, fruit and vegetable chilling.

Especially in the tough spots, in such conditions as meat packing and crop pre-cooling, where there are large amounts of moisture and extra air-borne causes of corrosion, No-Frost equipment out-lasts, out-performs and out-saves all other types.

Because it PREVENTS all frost or ice formation from the start, Niagara No-Frost gives you always full capacity, prevents waste of power. You escape all trouble and labor of defrosting, have rooms that are always clean and sanitary, enjoy the lowest operating costs per ton of refrigeration.

For more than a quarter of a century Niagara No-Frost durable, dependable equipment has been making money for its users.

Write for Bulletin 105.

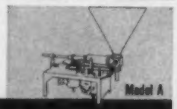
NIAGARA BLOWER COMPANY

Dept. FE-6, 405 Lexington Ave., New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

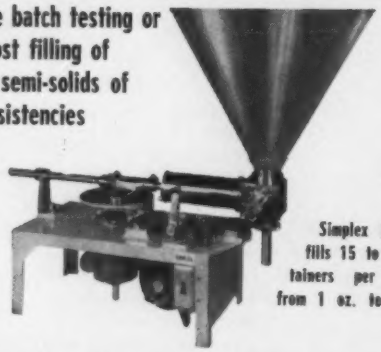
CIRCLE 125 ON INQUIRY CARD

Compact, inexpensive



SIMPLEX PISTON FILLER

for accurate batch testing or fast, low cost filling of liquids and semi-solids of varying consistencies



Simplex Model A fills 15 to 30 containers per minute from 1 oz. to 32 oz.

- REMARKABLY SIMPLE CONSTRUCTION—VIRTUALLY MAINTENANCE-FREE!
- EASILY CLEANED IN A FEW MINUTES!
- HAND LEVER CUTS OFF FLOW INSTANTANEOUSLY!
- DURABLE 316 STAINLESS STEEL IMPERVIOUS TO ACIDS!
- EVERY MODEL ENGINEERED TO CUSTOMER REQUIREMENTS FOR GIVEN RANGE OF OPERATIONS!

Write for prices and Bulletin 106 • Representatives in all principle areas

Mfg. by **F. L. BURT CO.** 1144 Howard St., San Francisco, Calif.

higher yield per acre, greater disease resistance, better straw strength to facilitate harvesting, larger berries, etc.

In Brewing

Currently, American brewers are only at the stage of giving these malts a good hard look. The darker color and increased soluble protein are problems yet to be resolved. Research is now under way.

GA malts reportedly don't affect beer stability. Pilot tests point to good CO_2 retention and no changes in rate or type of chill haze. Beer foam is unaffected, too.

Notable improvements in pilot brewhouse performance include:

1. Shorter conversion time with no adverse effect on kettle break or run-off time.

2. Increased yield as more extract is leached from the mash. This is more noticeable with coarser grinds, in which GA treatment has raised extract almost 1% (based on dry weight of grains).

GA malts give worts higher RDF values, but that is easily controlled by adjusting conversion temperature. They do not affect beer fermentation or cellar operations. Rates of fermentation and yeast propagation are essentially the same.

Other Applications

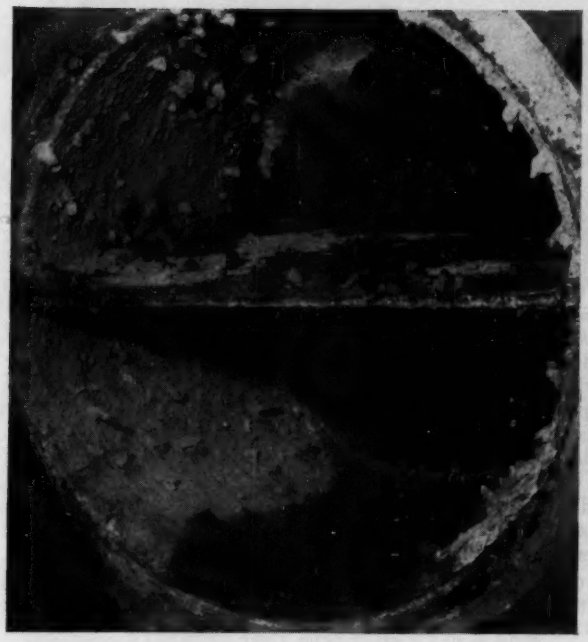
GA has also created interest in the treatment of crops other than barley, those of canners and freezers for example.

Researchers have shown that certain crops can attain marketable maturity days earlier—with no adverse effect on quality or yield. They are investigating the use of GA to plant certain crops earlier, especially under cold, damp conditions. Treating vegetable seeds so they can be planted further south or north is another possibility. Moreover, they have stimulated fruiting so that fruit-tree plantings might be shifted.

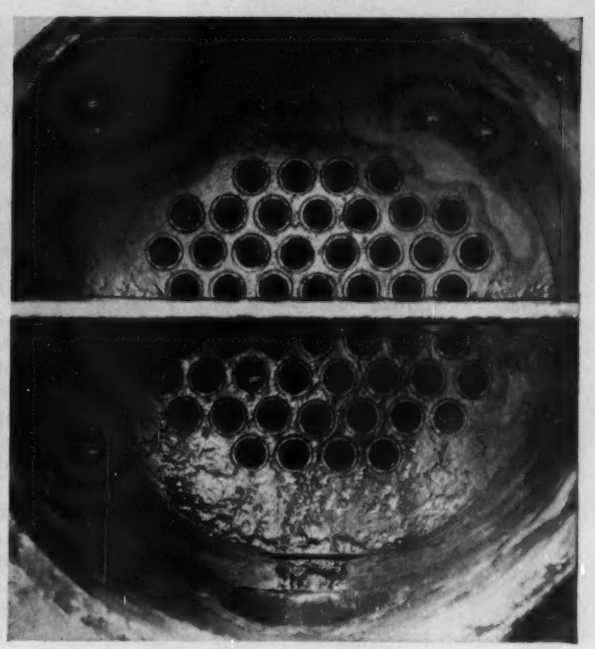
Pomologists have increased juice and ascorbic acid contents of certain citrus fruits, while giving them thinner rinds. And they have tried to make crops, such as spinach leaves, stand up better for more efficient harvesting.

However, there are problems in putting these applications to commercial use. Treatment cost is one, insufficient and variable results are another. And the job of getting FDA approval is involved, costly, and time-consuming. (End)

Descale equipment quickly, safely —without dismantling!



BEFORE—This condenser was badly clogged with hard-water scale. Mechanical cleaning of the tubes would have been difficult, time-consuming and costly. To use hydrochloric acid would pose danger to nearby equipment and personnel.



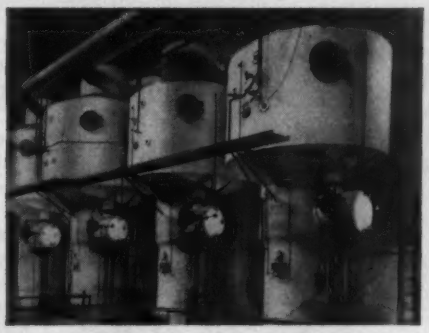
AFTER—It was easily cleaned *without dismantling* by circulating a water solution of a sulfamic acid-based cleaner for an hour. Short downtime, *no* danger to equipment and complete safety for personnel!

Use a dry-acid cleaner based on Du Pont Sulfamic Acid

They're effective. Dry-acid cleaners dissolve hard-water scale and certain food deposits found in cooking vessels, evaporators, heat exchangers, pasteurizers, etc. Yet they're much less corrosive to metal than hydrochloric-acid cleaners, particularly on stainless steel!

They're easy, safe. Just dissolve the solid cleaner in water and circulate through the equipment. Often the acid can be added dry. No danger of broken carboys, spilled liquids, or toxic fumes—glasses and gloves the only protective clothing needed!

They're economical, fast. 1 lb. of dry cleaner does the job of several lbs. of liquid acid—you save on shipping, handling, storage and downtime because there's no dismantling. You clean in place!



Food process equipment like these evaporators is easily descaled with a cleaner based on Du Pont Sulfamic Acid. No dismantling—the cleaner is circulated with the evaporator feed pumps.

Ask your supplier of maintenance cleaners for information on dry-acid cleaners, or send the coupon for booklet and names of formulators offering these products.

DU PONT
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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Industrial and Biochemicals Department, N-2545FE
Wilmington 98, Delaware

Please send your "Descale" booklet and names of formulators offering cleaners based on sulfamic acid.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

Set Pattern for Progress

Scientific flavor analysis and product formulation, plus advanced engineering, create new corn chip and better process to make it

EXEMPLARY PATTERN for progress has been set by Arthur D. Little and Morton Foods. The Cambridge consultants and Dallas specialty food firm teamed up to create something new in corn chip taste, shape and manufacturing advances.

New product is Chip-O's — round, wafer-like, corn chips of controlled size and thinness. Basic ingredients are yellow and white corn (limed). Deep-fried in coconut oil, chips are packaged in double-wall, heat-sealed cellophane. Shelf-life at least twice that of potato chips is achieved.

Produced at rate of 96,000 lb./week for distribution in 10-state area of Southwest, the chips will go national through regional licensing arrangements. Demand reportedly is running strong. Chip-O's are not among the 85% of new products that fail.

Result of 3½ years of research and development, the chips were formulated to achieve the limed corn flavor associated with Mexican foods. ADL scientists did this with the aid of their flavor-profile technique that identifies the nature and amplitude of flavor components.

Full bodied flavor for "lots of entertainment in the mouth" was achieved. And quick disappearance of flavor after swallowing avoids undesirable after-taste that would spoil the taste fun.

Invests Half Million

Investment in the product by Morton was looking past one-half million dollars at completion of first production line. And a process engineered for economy, product uniformity and close quality control was included in this reasonable investment.

FRANK K. LAWLER
Editor, "Food Engineering"

ADL and Morton searched out better unit operations for the corn chip process. Here they are, step by step:

► **1. Cooking grain under pressure, and with continuous mechanical agitation, takes only 25 min.** in 250-gal. vessel containing corn, calcium hydroxide and water. Product is pumped from cookers to soaking vessels. Portion of liquid is channeled back to sweep over remainder of product, ratio of liquid to solids being small.

Conventional open kettle cooking requires 90 min.

► **2. Soaking is completed in 1 hr.** in 350-gal. holding tanks with the aid of intermittently controlled agitation. Soaked grain is conveyed to cutter.

Old process takes 18 hr.

► **3. Grinding is done in revolutionary new Urschel cutting mill** which gives control of size, shape and character of the pieces, keeps temperature down and has low power requirements.

Inspired by ingenious Urschel potato slicer, the cutter has a stationary vertical cylinder composed of hundreds of small knives. Inside this cylinder, the product is revolved at several thousands rpm., and centrifugal force throws the grain against the knives. These cut away uniform pieces of corn and discharge them through openings in wall of cylinder.

Milled corn has dry texture and flows readily into standard screw-type meat grinder for final blending.

This is the first time the Urschel Model "G" Cutting Mill has operated on a production basis. But the mill is presently undergoing production testing on a number of food items. Among them is meat, cut to tenderize it. Cutting is said to be so fine that the pieces compact into a chunk of meat with the appearance of the original.

► **4. Continuous forming is achieved by sheeting the dough** to controlled thinness in a two-step roll much as is done in a cracker bakery. To avoid puffing in fryer, dough is docked, or pricked by pins on roll by patented method. Then sheet is cut into disks by die roll, as in biscuit bakery.

Trimmings are conveyed continuously back to the rolling mill to avoid waste.

► **5. Deep fat frying is continuous** (patent applied for) in a MacBeth unit, 35 ft. long. Chips enter the coconut oil with moisture content of 50 to 60% and come out crisp and toasty brown. Coconut oil imparts superior "bite quality" to chips. No stabilizer is added to the oil.

► **6. Salting is automatic,** the seasoning being sifted onto the chips after they leave fryer. Chips are turned over for salting by tumbling from one conveyor to another.

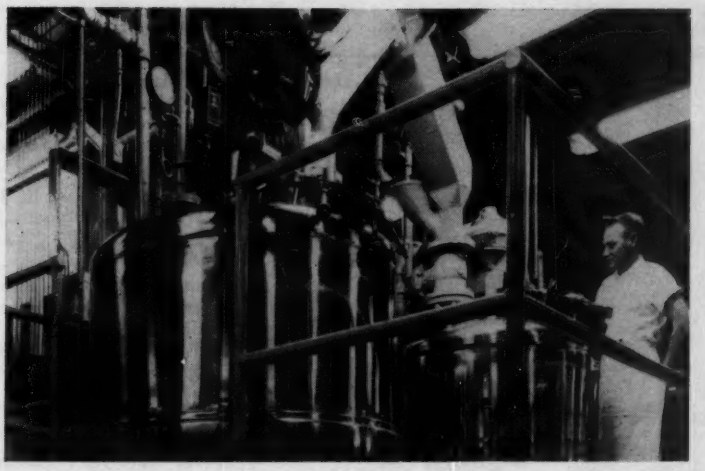
► **7. Cooling** takes place in air at room temperature as chips travel via vibrating conveyor to the packaging.

► **8. Packaging is automatic.** Mira-Pac machines (FE Aug. '60, p. 82) are fed from overhead conveyor, and they discharge filled, sealed bags onto rotating tables. A girl at each machine puts the bags into shipping cases. Bag sizes are ⅞ oz. (5c.); 3¾ oz. (19c.); 5¾ oz. (29c.); 10½ oz. (49c.). Bulk cans supply the institutional trade.

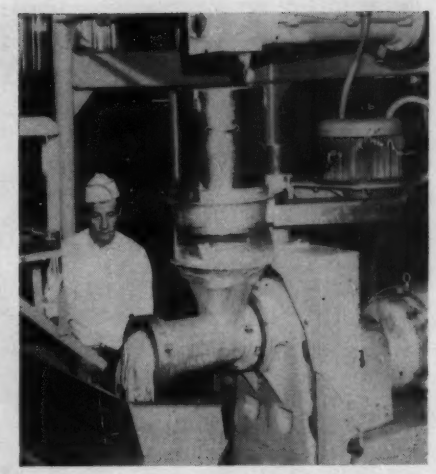
► **9. Quality control is rigorous.** Samples are taken at various points of production for inspection and analysis. pH is maintained at 8.5 to 9. Packages are picked up from stores after three weeks to assure freshness.

Morton turns out 2,200 lb./hr. in its present plant, and little labor is needed on the new manufacturing line. The operation occupies 20,000 sq. ft. (End)

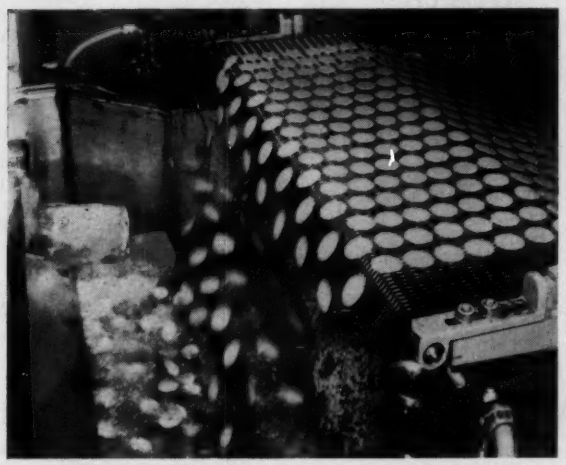
Based on information obtained at press conference, from representatives of Arthur D. Little, Urschel Labs, and Morton Foods.



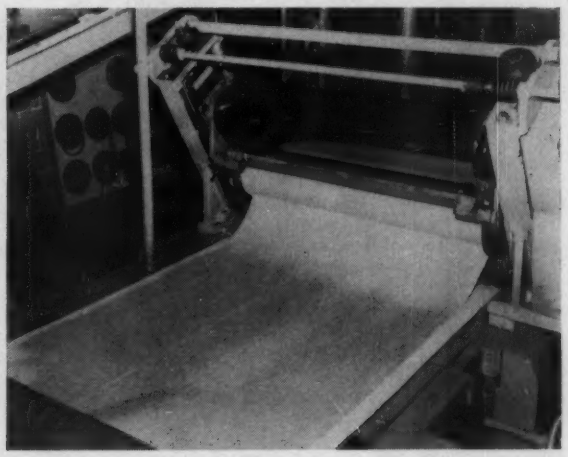
1 **SAVE 18 HOURS**—Corn grains cook under pressure in 25 min. Conventional time, 90 min. Soaking after cooking is cut from 18 hr. to 1 hr.



2 **KNIVES MILL GRAIN** — New Urschel mill cuts instead of crushes soaked grains. It is mounted above, and feeds into, meat grinder for blending.



4 **CHIPS DIE-CUT, FRIED**—Dies in roll cut disks from dough sheet. Disks drop into coconut oil in MacBeth continuous fryer.



3 **SHEETS CORN DOUGH**—To control shape and uniformity, corn dough is rolled into sheet for die cutting.

5 **MAKES, FILLS BAGS**—Fed from overhead conveyor, Mira-Pac machines automatically form, fill and seal bags with little labor (FE, Aug. '60, p. 82).

6 **FINISHED PRODUCT** — Package is a printed, heat-sealed, double-wall, cellophane bag.

Men & Companies

Lee Talley

Coke Boosts Talley . . . Lee Talley has been elected board chairman and re-elected president of The Coca-Cola Co. He succeeds William E. Robinson who has been chairman since '58.

Mr. Robinson, who chose not to stand for re-election, continues as chairman of the executive committee. He said that he wishes to devote himself to certain personal projects requiring time for travel and research, but that Coca-Cola will still continue to be his major business interest.

J. Paul Austin, president of The Coca-Cola Export Corp., was elected executive v.-p. of the parent company, and Clyde K. Farris, manager of the Insurance Dept., was elected an assistant treasurer.

Edward L. Norton

New RC Chairman . . . Edward L. Norton, Birmingham, Ala. financier, has been named board chairman of Royal Crown Cola. Mr. Norton, chairman of board's finance committee and a board member since '48, succeeds T. Hiram Stanley whose retirement was announced last December.

Other major executive changes include W. E. Uzzell who moves up from v.-p. and general sales manager to v.-p. and marketing director; and Bradford D. Ansley, former public relations and sales consultant, takes over as sales v.-p.

Royal Crown, the former Nehi Corp., markets the nation's third best selling cola.

George A. Rodriguez

Named Mission Head . . . George A. Rodriguez has been elected president of Mission of California Inc. at the board meeting of firm's parent organization, Cott Beverage Corp. He was also designated export v.-p. of Cott.

In his new post, Mr. Rodriguez replaces John J. Cott who will continue to serve as president and chief executive officer. John A. Sanders, former Mission v.-p., moves up to executive v.-p.

At the annual meeting, Mr. Cott told company stockholders that the firm expected record profits and sales in '61. He cited sharp increases in world-wide franchises, greater automation, and expected new products nearing final production stages as the basis of his optimistic forecast.

Personnel

John St. John moves up to v.-p. and treasurer of Minute Maid International Div. of Coca-Cola Export Corp.

Roy M. Anderson, former assoc. general counsel for Continental Baking Co., is now a v.-p.

Hermann Paris, board chairman of Southern Frozen Foods prior to its merger with Seeman Bros. Inc., now holds board membership at parent firm.

Walter E. Clark, Harry O. Mathews, and **Clair V. Short** become v.-p.'s at Armour and Company.

William H. Paulis retired from Dole Corp. after 30 years food industry service with Dole and Paulis Bros. Packing Co., Salem, Ore.

John I. Cervini moves up to assistant v.-p. of Standard Brands Sales Co.

Don L. Grantham assumes regional v.-p. post at Beatrice Foods Co.

Dr. Hans W. Vahlteich, research and quality control v.-p. at Corn Products Co., announced retirement plans after 37 years with Best Foods and CP.

Herbert Humphreys and **Emanual M. Terner** have been elected to board membership at National Dairy Products Corp.

J. G. Wharry, president of Quaker Oats Co. of Canada Ltd., takes over board chairmanship of Grocery Products Manufacturers of Canada.

Harvey H. Bundy Jr., v.-p. and treasurer of Gorton's of Glaucester, is now president of National Fisheries Institute.

Thomas C. Fogarty, president and a director of Continental Can Co., assumes directorship of American Sugar Refining Co. **George F. Lamb** takes over as firm's v.-p. and treasurer.

Ira O. Shy announced resignation as sales v.-p. of National Tea Co. and will move over to Cook Coffee Co. where he will concentrate on firm's stepped up expansion plans.

James D. North has been appointed marketing counselor and **Charles P. Pope** marketing manager of Birds Eye Div. of General Foods.

Anthony A. Buford, general attorney for Anheuser-Busch, has resigned from the company.

Harold A. Bendixen has been elected president of Clinton Corn Processing Co.

B. Lowell Jacobson moves up to industrial relations v.-p. at Pepsi-Cola Co.

F. G. Barnum and **R. P. Taylor** move up to v.-p.'s at H. J. Heinz Co.

Dwayne O. Andreas, board chairman of Honeymead Products Co., has been appointed by Pres. Kennedy to the American Food for Peace Council.

Samuel F. Hinkle, president of Hershey Chocolate Corp., will be recipient of the 11th Stroud Jordan Award of American Assn. of Candy Technologists.

Henry H. Nieman moves up to v.-p. at National Tea Co.

Industry

National Biscuit Co. and **The Cream of Wheat Corp.** have reached an agreement in principle for joining the two companies.

Borden Co. has acquired **Wyler & Co.,** manufacturer of dehydrated food products.

Beatrice Foods Co. announced acquisition of **Pik-Nik Co.,** distributors of Pik-Nik brand vacuum-packed shoestring potatoes.

Nalley's Inc. has reached preliminary agreement on purchase of all **Venus Foods** stock.

Major American Food Companies have already contributed approximately $130,000 to help start the Fifth International Food Congress and Exhibition scheduled for the New York Coliseum in September, '62.

Thomas J. Lipton Inc. has signed agreements for purchase of assets and world wide rights to **Good Humor Corp.,** production and marketing organization for ice cream specialty products.

Dole Corp. and **Columbia River Packers Assn.** may merge into **Castle & Cook Inc.** resulting in a corpora-

tion having total assets of approximately $117 million.

Pepsi-Cola International recently opened plants in Leeds, England; Munich, Germany; and Ciudad Mante, Mexico.

Pet Milk Co. Ltd. successfully concluded negotiations for acquisition of **Van Kirk Chocolate Corp. Ltd.**, Toronto.

Pillsbury Co. has gained controlling interest in a major French food company, **Establissements Gringoire, S. A.**

Associated Industries

Container Corp. of America has acquired production facilities in Los Angeles that increase its sales capacity of plastics packaging, especially in western states.

Food Machinery & Chemical Corp. plans construction of a multi-million dollar chemical plant on the site of obsolete U. S. Naval Ordnance plant at South Charleston, W. Va.

Dr. John H. Long has been elected a v.-p. and executive committee member of Hercules Powder Co.

American Can Co. will open two new Oregon plants, one located in Astoria and another in Eugene.

Dr. Ernest M. Weber has been elected R&D v.-p. at Chas. Pfizer & Co., Inc.

E. E. Ellies moves up to president and chief executive officer of **Tee-Pak Inc.**

Owens - Illinois Glass Co. has begun construction of a glass container plant near Tracy, Calif.

Container Corp. of America purchased Los Angeles production facilities from Cal-Dak Co. for manufacture of rigid plastic containers and other custom-molded packaging materials.

W. R. Grace & Co. and **Chemore Corp.**, general representatives of the U. S. in Montecatini, Milan, Italy, have reached agreements to cooperate in marketing of polypropylene in Italy.

Pet Milk Co. and **C. H. Musselman Co.** have reached basic agreement on a plan to merge. Proposal involves exchange of Pet common for all capital stock of Musselman.

Deaths

W. Clarke Swanson, 53, president of Butter - Nut Foods Co., director and consultant for Campbell Soup Co., and former president of C. A. Swanson & Sons Co.

Putnam D. McMillan, 79, director of General Mills.

Ellis C. Baum, 65, former director of Continental Baking Co. and v.-p. of its Hostess Cake Div.

James Ford Bell, 81, founder of General Mills.

$30 MILLION ANNUALLY, an increase of 50% in '60, is spent on canned soft drinks. At American Can Co.'s 60th annual stockholders meeting, president Roy J. Sund holds two of company's MiraCans on a growth chart of canned soft drinks to show chairman William C. Stolk how sales continue their rapid upswing in '61.

Dairymen!

Here is a Valve Designed Exclusively for YOU!

by Strahman

Stops STEAM and WATER LEAKS

Eliminates CRACKED DISCS, WIRE DRAWING, EXPANSION and CONTRACTION PROBLEMS

A resilient sealing ring and stainless steel piston replace the metal seat or disc found in the conventional valve, the cause of most valve troubles. The Strahman Valve seals itself as a cork seals a bottle. In throttling, the erosive action of the elements passing through the valve cannot have any effect on the sealing surfaces.

Strahman Steam and Water Valves are made of Bronze construction, with Stainless Steel Stem and Piston, assuring long life.

Write direct for complete catalogue

STRAHMAN VALVES, Inc.

NICOLET AVE., FLORHAM PARK, N. J.

CIRCLE 99 ON INQUIRY CARD

Sales-proved clarity and longer shelf life with Celite Filtration

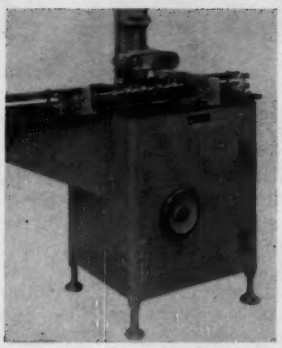
Products such as juices, jellies, salad and cooking oils require sparkling clarity to sell. Filter them with Celite® diatomite and they'll surely stand out in any company. Celite gives them the brilliant clarity that makes shoppers stop and take notice. And it does this at the lowest possible cost.

Celite filters out the most minute solids and impurities which could otherwise affect clarity and shorten shelf life. What's more, it provides a truly polished appearance at the fastest flow rates obtainable. Filtering with Celite is a trouble-free, virtually automatic process. With the widest selection of standard and special grades from the most dependable diatomite source in the field, Celite will give you the exact degree of clarity desired. And, in addition, Celite grades now include Celite perlite. See your J-M Filtration Engineer for full details or write Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario.

Celite Division filter aids, when used as such, are not considered food additives as defined by FD&C Act Amended, Section 201(s).

JOHNS-MANVILLE JM

new equipment & supplies



600-Per-Min. Coder

This code dater marks bottoms of jars, bottles, cans, or aerosol containers at speeds up to 600 per min., depending upon size and style of container. Standard model (2-S) handles containers ranging 1½-3½ in. dia., and from 3-9 in. high.

In operation, unit simply replaces a section of conveyor. Containers are automatically indexed and dated as received, and printing wheel is readily removable for changing type. Rubber or vinyl type, individual pieces, or logotypes can be used. Dating head is readily adjusted while machine operates to obtain precise contact.

Designed for minimum maintenance, unit has automatic safety devices and one-shot central lubrication system.—*John R. Nalbach Engineering Co., Chicago.*

Circle 401 On Inquiry Card

SERVICE CENTER

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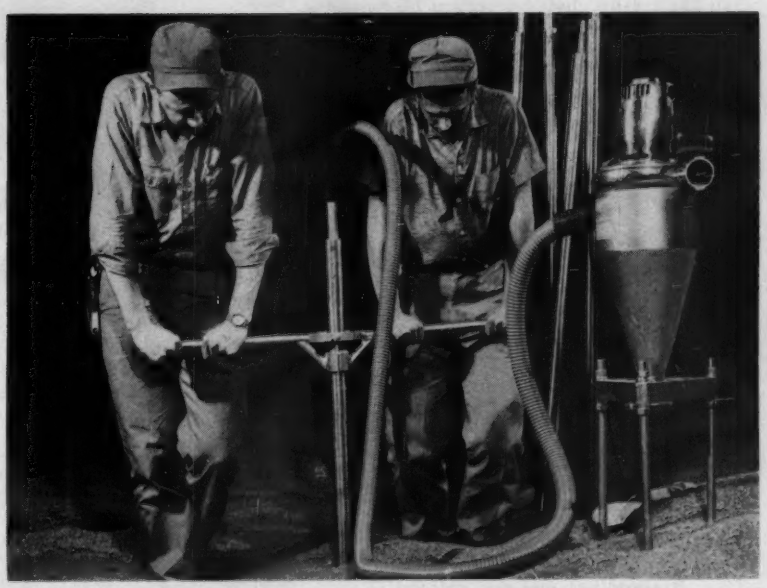


PNEUMATIC PROBE enables cross-section sampling of an entire grain pile, or of portions at varying depths. It also permits insecticide application.

Speeds Sampling of Granular Materials

Quicker and more accurate sampling of bin-stored grain is offered by this vacuum-powered pneumatic probe.

Called "Probe-A-Vac," it uses air circulation through a tube-within-a-tube and a special pointed nozzle to 'eat through' a pile of grain. Two men reportedly can make three probes hourly in wheat 50-ft. deep, which is about half the time and labor required with conventional 'bucket' probes.

Unit can also be used to place temperature cables. And 'hot spots' due to insect damage can be treated by penetrating the infested area and pouring insecticide through the tube. Additional uses under examination include special pneumatic truck and car probers that convey grain directly to sampling rooms; a truck-mounted unit for probing grain stored in other than conventional elevator bins, and adapta-

(Turn page)

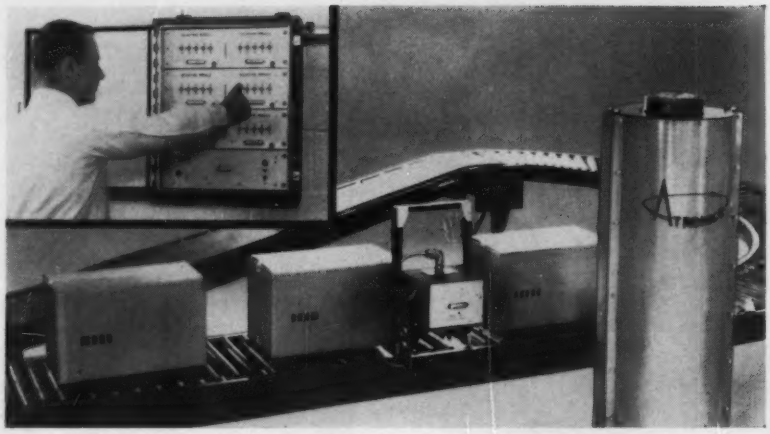
GRAIN SAMPLE from cyclone separator drops into collecting pan, while operator (left) couples an additional section of probe pipe.

tions for probing a variety of other granular commodities.

In operation, suction in the inner tube 'airlifts' the grain into a cyclone separator, where it is held for sample. The probe can draw a representative cross-section of the entire pile or a portion of grain from depths exceeding 80 ft. Key to the unit is the probe-point nozzle which guides grain into the air flow. Nozzles are available for both fine and coarse grains.

Sampler is made in two models. One has a 1-hp. motor designed for probes up to 30 ft. The other has a 1.5-hp. motor for deeper probes. —*Cargill, Inc., Minneapolis.*

Circle 402 On Inquiry Card

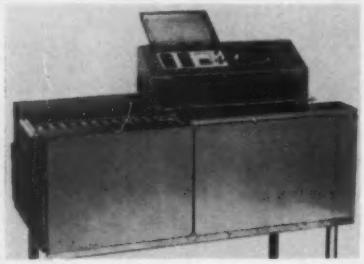


Diverts Coded Cartons to Proper Destinations

Electronically controlled, this carton selector system automatically differentiates among 31 different types of conveyed packaged products. Moreover, it can divert each of them to any of 31 possible destinations. And if desired, a number of different products can be routed to a single destination.

In this Model 415, the entire operation is monitored by one setting of the system's toggle-switch control console. Each type of product is identified by a code printed on the carton, and read photoelectrically by the selector. The system, which also counts and totals the passing cartons, operates at conveyor speeds up to 200 fpm. —*Atronic Products, Inc., W. Conshohocken, Pa.*

Circle 404 On Inquiry Card



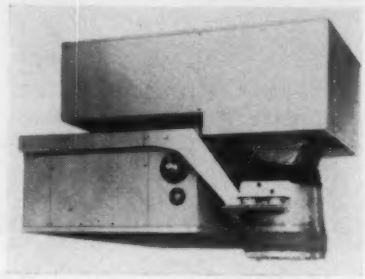
Offers 5-Way Sorting

At package-line speeds to 300 per min. this 5-way classifier sorts underweights, overweights, and onweights into five separate channels. Thus it simplifies makeup or takeaway in package contents.

Moreover, the unit may also be used for portion control, counting, and grading by weight.

Package weight may range to 10 lb. Accuracy is ±1/32 oz. and range is adjustable from 1/10-2 oz. All models have simplified electronic controls in a compact housing, and measure under 30 in. wide x 59 in. long.—*Illumitronic Systems Corp., Sunnyvale, Calif.*

Circle 403 On Inquiry Card



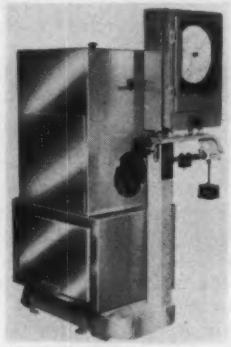
Automatic Bagger Offers Speed, Accuracy

Free-flowing products, such as powdered sugar and starch, may be filled with this gross-weighing bagger at rates up to 300 lb. per min. Accuracy is ± 0.1%.

Known as G18R, unit has a vane type feeder with two shut-off gates for dual feed. Both gates are open during bulk feed, but during dribble feed only the smaller gate remains open. Gates are gasketed with heavy rubber bonded to steel for positive shut off.

Mercury switches, actuated by scale weigh beam position, control the bagging process. — *Thayer Scale Corp., Pembroke, Mass.*

Circle 405 On Inquiry Card



Recording Dry Feeder

This volumetric feeder with loss-of-weight recording offers accurate, uniform delivery of dry materials at rates ranging 0.0045-2.8 cu. ft. per hr. A screw-type feed section prevents flooding, and built-in diaphragm agitators prevent arching of material in the hopper.

Called Series A-690, unit has an adjustable knob that controls feed rate, and a flashing light indicates proper operation. Quantity fed during any desired period is read from 24-hr. or 7-day charts.

(Continued on page 104)

FOR MORE INFORMATION...

. . . simply circle key item number on handy Inquiry Card—back of book. Then print your name and address, and mail. For your convenience, these items are also listed and keyed in Reader Inquiry section.

Now! Gels without sugar for dietetic foods

Sauces – fruit jells – aspics – relishes – desserts – low-calorie jams

Here's a new field – with new profits – for you! With EXCHANGE LOW METHOXYL PECTIN, you can now make a *full line* of gelled foods of any degree of sweetness – even sugar free and low in calories for diabetics and dedicated weight-watchers!

L.M. Pectin is the only pectin that forms a true gel without sugar. The gels keep their shape and firmness at room temperature – yet are tender, elastic, sparklingly brilliant and perfect for flavor. GET FULL INFORMATION on this exclusive development of Sunkist citrus research – including technical data and formulas. Call your Sunkist man or mail the coupon today.

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Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

Gentlemen: Please send data on use of Exchange Low Methoxyl Pectin in ( ) low-calorie jams ( ) aspics ( ) fruit jells ( ) relishes ( ) desserts ( ) sauces ( ) other.

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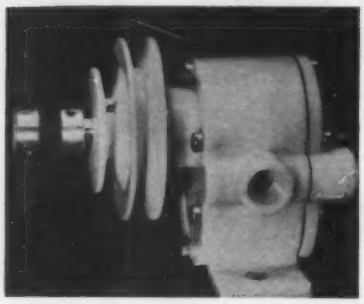
Exchange

A direct-reading register shows amount of material remaining in hopper at any time. Visual alarm indicates hopper depletion.

The accompanying solution tank gives thorough mixing, which is facilitated by water jets or an optional mechanical agitator.—*Wallace & Tiernan Inc., Belleville, N. J.*

Circle 406 On Inquiry Card



Sanitary All-Plastic Pump

Said to handle any liquid, this all-plastic pump offers substantial cost saving, high efficiency, quiet operation, and minimum maintenance.

Unit is made of Delrin, a new plastic with exceptional dimensional stability, toughness, and corrosion resistance. All major parts of the pump are molded to close tolerance.—*Planet Products Corp., Chicago.*

Circle 407 On Inquiry Card

Manual Multi-Packer Available for Lease

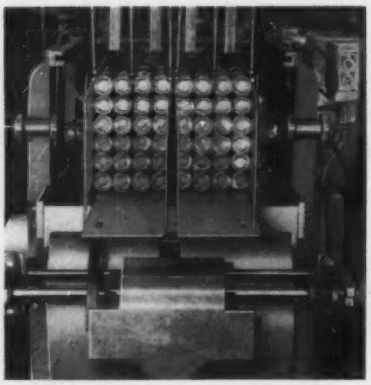
This multi-packer offers processors economical means for getting into wrap-around multiple packaging.

Unit (Jak-Et-Pak Junior) runs 10-12 six packs per min. Operated by foot pedal, it handles conventional 2x3 six-packs with further groupings to be added as required. Can and bottle sizes from 7-16 oz. can be packed on the jig.

Leasing terms for the equipment (including installation and service charges) amount to $500 for two years—$375 the first year and $125 the second. Rental is $25 for each year thereafter, with a $25 charge for change parts for each type of container to be multi-packed. Machine is 32½ in. long, 19½ in. wide, and 12 in. high.

Additional equipment soon to be available will boost line speeds to 120 bottles or cans per min. at an anticipated cost well below $1,000. —*Continental Can Co., New York City.*

Circle 408 On Inquiry Card



Modified Caser Permits Double-Case Discharge

Modification of this caser with a double-case discharge nozzle permits interchangeable use of two small top-opening cases or a single large case—without sacrificing total can output. Moreover, casing output is up to 50% greater than when the same size case is loaded singly.

Casing patterns for this modification range 202x306 to 303x406 can sizes.

Units (Model 3 Casers) now handling can sizes within this range in large shipping cases may be easily converted with a set of change parts. Thus, a caser now loading 6 oz. cans (202x306) in a single 6x8x2 pattern (96 cans/case) may be converted to load two 6x4x2 patterns (48 cans/case), simultaneously. Although modified, the caser may also be used for the larger size case without reconversion.

Essentially, the modification consists of using a split discharge nozzle that accommodates double case feeding. The nozzle accumulates two vertically positioned patterns simultaneously. Two empty shipping cases are correspondingly positioned, one over each nozzle section provided by the split. A common support and lowering device accommodates both cases. — *Food Machinery & Chemical Corp., San Jose, Calif.*

Circle 409 On Inquiry Card

New Plastic Foam Offers Many Insulation Benefits

Improved insulation of pipes, trucks, and freezers are applications cited for a new rigid urethane foam board.

Called Thurane, it offers a "K" factor of (0.16-0.17) at 70F., high heat distortion, and excellent solvent resistance. Its unicellular structure resists water penetration and water vapor transmission.

Low thermal conductivity enables using thinner sections of this foam to provide the same thermal insulation as a greater thickness of conventional insulation. — *Dow Chemical Co., Midland, Mich.*

Circle 410 On Inquiry Card

Turbine-Type Flow Meter (Turbometer) uses new force-balance principle to position the rotor. Meter reading is linear function of input frequency, which enables one-point calibration. Combined with maker's density gage (Densitor), system provides accurate mass-flow data. — Co.-Engineering Co., Boonton, N. J.

Circle 411 On Inquiry Card

Coupon-Placing Unit puts light, flat objects inside the package. Automatic indexing eliminates missed packages, inclined hopper eases loading.- -Thiele Packaging Machinery Co., St. Paul, Minn.

Circle 412 On Inquiry Card

Ultrasonic Liquid Level Switch has dual-crystal design that responds only to a complete liquid path between sensing elements. Accurate to ±1/64 in., unit may be used with any liquid and for additional functions as flow monitoring, mixing control, and leak

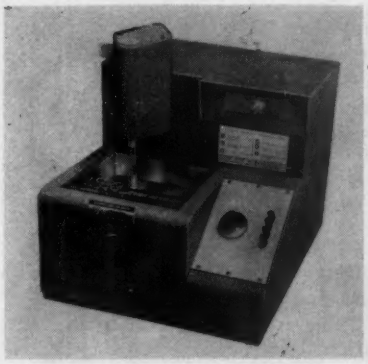
detection. — Liquidometer Corp., Long Island City, N. Y.
Circle 413 On Inquiry Card

Revolving Beacon frightens birds, keeps them from nesting in plant storage areas. Unit (Birdlite) has special vertical filament bulb and parabolic lenses that produce harassing flashes of light.—Trippe Mfg. Co., Chicago.
Circle 414 On Inquiry Card

'Turn-Over' Jar Cleaner automatically adjusts to handle any size jar. Successive applications of air jet and suction remove all foreign matter.—Standard Metal Products Co., Chicago.
Circle 415 On Inquiry Card

Versatile Air Conditioner supplies heating, ventilation, and cooling needs, also removes 90-98% of air-borne bacteria. Units (Klimatic King Series 70) are termed specially useful in processing of cottage cheese.—King Company of Owatonna, Owatonna, Minn.
Circle 416 On Inquiry Card

For the Lab



Improved Cryoscope

A major advance in detecting watered milk is offered by this new cryoscope.

Called Advanced Milk Cryoscope, unit is designed around the optimum thermodynamic freezing curve, rather than warping the curve to suit the instrument. Particular attention has been given to accurate determination of the freezing plateau.

Instrument has a pre-chill chamber, approved pushbutton operation and improved refrigeration design for greater sample repeatability and speed. Probes are tested to 0.0001C., and modular design permits adding on of components.—*Advanced Instruments, Inc., Newtown Highlands, Mass.*
Circle 417 On Inquiry Card

Magnetic Flowmeter has flow tube of non-wettable plastic that is removable for convenient sterilization. Accuracy of unit is ±1% of range, 0-1 liter/min.—Foxboro Co., Foxboro, Mass.
Circle 418 On Inquiry Card

Integrating Recorder speeds quantitative chromatographic analysis by charting peaks and areas simultaneously while chromatogram is being produced.—Fisher Scientific Co., Pittsburgh.
Circle 419 On Inquiry Card

PNEUMATIC VACUFLOW, Jr.

SEMI AUTOMATIC DUSTLESS POWDER FILLING

Great flexibility. Immediate adjustment to different densities. Switches from non-pulsating to tamping action, at will.

THE VACUFLOW JUNIOR is ideally suited for handling products such as soluble coffee, powdered milk, baby powder, chemicals, insecticides and many other free flowing as well as non-free flowing powders. Its low initial cost and durable, versatile performance means "lower cost per container" — truly typical of Pneumatic bottling and packaging equipment.

PNEUMATIC

PNEUMATIC SCALE CORPORATION, LTD. 91 Newport Avenue, Quincy 71, Mass. Sales Offices: *New York; Chicago; Dallas; Rochester.* Agents: *Fred Todt Company, Los Angeles, San Francisco and Seattle. Rockwell Pneumatic Scale Ltd., London N.W. 2, England; O.R.M.A. Paris, France.* Subsidiaries: *Delamere & Williams Co., Ltd., Toronto; Carbert Manufacturing Co., Inc., Cambridge, Mass.*

FOR A PERFECT RECORD OF RETORT PROCESSING

Hang a Cook-Chex tag on every basket before it goes into the retort and eliminate all guess-work when it comes out of the retort. On each Cook-Chex tag, a **chemically impregnated circle** turns from purple to green, to provide infallible proof of proper and complete "in-can" processing. Cannery inspectors approve and recommend Cook-Chex. Major packers all over the world use them to:

1. Eliminate wrong cook schedules.
2. Guard against "by passing" retorts.
3. Warn of any failure in retort processing.
4. Keep retort baskets in sequence.
5. Provide low-cost permanent records for cooking plants.

The cost of Cook-Chex protection is negligible... less than one cent for 75 cases of No. 300 cans.

SEND FOR FREE TEST SUPPLY TODAY

You'll receive a generous supply of Cook-Chex at no cost; send your name, title, and plant address to Dept. FE-6.

ATI **Aseptic-Thermo Indicator Company**

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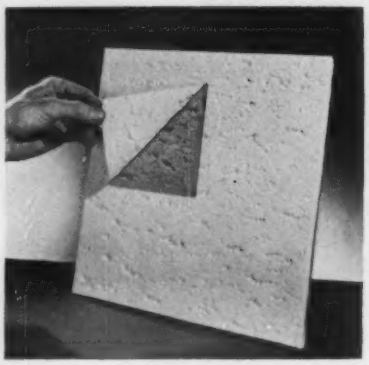
Plant Sanitation & Maintenance



Sanitary Acoustical Tile

A new vinyl-faced acoustical ceiling material combines the attractiveness of natural fissuring with outstanding maintenance characteristics.

Called Vinyl Face Travertone, it is designed especially for areas requiring high standards of sanitation, thus withstands repeated washing and scrubbing. A thin vinyl film stretched over the face of the tile protects it from water damage and, through diaphragmatic action, transmits sound energy into the porous tile core where it is absorbed. The facing will not shrink, crack, or separate from the tile during service.

Material is incombustible and can be installed either by mechanical suspension or by cementing to any firm dry surface, such as plaster, gypsum lath, or concrete. Facing is pigmented white, but can be easily repainted without affecting acoustical quality or maintenance advantages. Product comes in 12x 12x¾ in. beveled edge tiles.—*Armstrong Cork Co., Lancaster, Pa.*

Circle 451 On Inquiry Card

Unit Monitors Strength Of Cleaning Solution

By automatically gaging and controlling the concentration of cleaning solution in sanitizing systems, an electronic unit eliminates the manual attention necessary to assure proper cleansing and efficient use of soaps or detergents.

Called 'Soap Saver,' it continuously measures strength of solution and automatically starts a pump or other feed equipment when concentration drops below the desired level. When solution has been brought up to strength, unit stops the feeder and continues to monitor the solution. Its special sensing probe can detect small changes in solutions as weak as 1 part in 400 with an accuracy of ±4%.

Operated on 110v. a.c., unit has two control leads—one to the feed equipment, and the other, which is low voltage, to the sensing probe in the solution tank. — *Redford Corp., Scotia, N. Y.*

Circle 452 On Inquiry Card

Guards Foods and Hands

Special design of new Neoprene gloves offers sanitary food handling, worker hand protection, and long wear.

Lightweight and flexible, they are white outside with a red satinized lining. An embossed, non-slip grip provides safe handling, while contour design of finger and hand areas eliminate fatigue. Gloves resist chemicals, oils, oxidation, and abrasions.

Called N-37, they are available in small, medium, and large sizes, and in 10½-in. length to protect wrists and lower arms.—*The Pioneer Rubber Co., Willard, Ohio.*

Circle 453 On Inquiry Card

Effective Odor Control of decaying cannery wastes is provided by an anti-bacterial agent (Chem-Germ). One quart of the compound, suitably diluted, controls odors emanating from 80,000 lb. of solid semi-solid, or liquid vegetative wastes. An insecticide may be added to the agent, which is applied by a spray or drip system.—Chemical Insecticide Corp., Metuchen, N. J.

Circle 454 On Inquiry Card

Thermal Insulation for storage tanks and process equipment consists of polyester foam laminated with 15-gage vinyl sheeting. Material (Curon) is recommended for surface temperatures ranging 50-250F., and is supplied in 4x12 ft. sheets, 1-in. thick. Its "K" factor is 0.25 at 32F., 0.38 at 250F.—Reeves Brothers, Inc., N. Y. C.

Circle 455 On Inquiry Card

Food Ingredients & Additives

New Starch Offers Unique Freeze-Thaw Stability

A new tapioca food starch reportedly withstands 25 or more freeze-thaw cycles without liquid separation or change in texture.

Known as Purity 69, it is a modified, stabilized starch that extends low-temperature storage tolerance, also improves food appearance and eating qualities. Cook-ups are said to be clear, smooth, and short textured. Exceptionally stable, they do not set to a gel and offer quick release of natural flavors.

Also important is the product's resistance to breakdown at high temperatures and low pH. During retorting, viscosity increase is gradual and uniform, with maximum viscosity attained during the latter stages. A special grade meets NCA standards for thermophilic bacteria.

Typical applications of the new starch include baby foods, cream and fruit-pie fillings, frozen sauces, gravies, soups, and oriental foods. —*National Starch & Chemical Corp., New York City.*

Circle 466 On Inquiry Card

New Technique Offers High-Potency Enzymes

A new process for low-cost, volume production of certain hydrolytic enzymes offers preparations with exceptional potency, purity, and stability. Catalytic activity is reported comparable to that of pure crystalline enzymes.

Products currently produced include amylase, protease, and lipase —all by culture of bacterial microorganisms. High purity is particularly significant because it improves specificity, the key to efficient enzyme action. Moreover, it opens the door to applications formerly considered impractical because of impurities in conventional formulations.

The process is based on the belief that enzymes are fairly large molecules containing one or more 'action centers' that furnish catalytic power. The objective, therefore, is to separate the 'useless' portion from the action centers of the molecule, and to remove impurities usually present in natural enzyme systems.—*Western Biochemical Corp., San Francisco.*

Circle 467 On Inquiry Card

Vegetable Colloid Boosts Quality of Many Foods

Unique properties as a protective colloid, thickener, suspending and film-forming agent are cited for a highly refined, powdered hydrophilic colloid.

Called "V-7-E", it is soluble in either cold or hot water, and the resulting solution is tasteless, odorless, and virtually neutral with respect to pH. Hydration is rapid, but progressive, the rate being controlled by degree of agitation and temperature. Sols of 1% concentration are as viscous as honey at room temperature; at 3 oz. per gal., they are barely pourable.

Typical applications of the product include frozen desserts, fruit juices and cocoa beverages, salad dressings, comminuted meats, cheeses, and baked goods. — *The Burtonite Co., Nutley, N. J.*

Circle 468 On Inquiry Card

Lactic Culture Media of non-fat dry milk offer uniform and reliable seed beds for active culture development. Free of inhibitory substances, product (Shur-Seed) is packaged in 2.3 oz. packets.—Klenzade Products, Inc., Cultured Products Div., Beloit, Wis.

Circle 469 On Inquiry Card

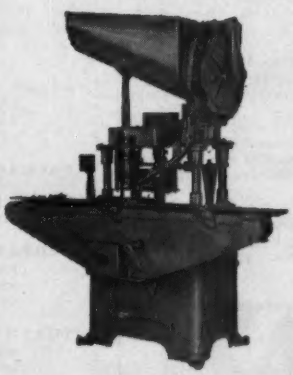
Sponge-Cake Emulsifier improves batter control, texture characteristics, and cake yield. Product (New Vanlite) is used at rate of 6-8 lb. per 100 lb. of flour.—R. T. Vanderbilt Co., New York City.

Circle 470 On Inquiry Card

RESINA

fully automatic

SCREW CAPPER

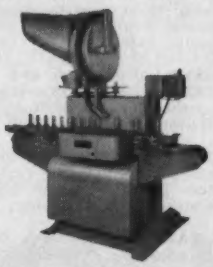


The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

TOPS THEM ALL

fully automatic

FITMENT APPLICATOR



Automatically selects plastic fitments (solid or perforated) with or without lift tabs and orients them into a chute. Passing container picks up fitment which is then snapped on the container. Speeds available up to 120 per minute or higher.

Descriptive literature and specifications on request.

RESINA AUTOMATIC MACHINERY COMPANY, INC.

572 SMITH STREET • BROOKLYN 31, NEW YORK

Just off the press

Free catalogs and bulletins on equipment, supplies, and services

PLANT ENGINEERING

STAINLESS STEEL PUMPS. Both rotary and centrifugal models of new sanitary unit are described in five bulletins, including illustrations and specs.—Creamery Package Mfg. Co., Chicago. **(211)**

PIPE FITTINGS, STEAM TRAPS. Provides illustrations and specs on complete line of steam traps, temp regulators, pipeline strainers, and heating specialties.—Sarco Co., NYC. **(212)**

PLASTIC SHAPES. Includes illustrations and specs of plastic stock, special shapes, and fabricated parts with services outlined for production of custom made units.—Garlock Inc., Palmyra, N. Y. **(213)**

WATER MIXING UNITS. Fully details mixing units and hose stations for instant steam or hot and cold water. Includes in-use illustrations. 20p.—Strahman Valves Inc., Florham Park, N. J. **(214)**

COLD STORAGE DOORS. Selection guide with illustrations and descriptive data provides all necessary information for proper unit selection. 20p.—Jamison Cold Storage Door Co., Hagerstown, Md. **(215)**

SEMI-STEEL VALVES. Gives specs and dimensions for all sizes of straightway, steam jacketed, multiport, and special order units. 43p.—Rockwell Mfg. Co., Pittsburgh. **(216)**

AIR FILTERS. Details cube type replacement filter used in air conditioning, heating, etc., for six to 12 times more service life than glass fibre panels. 4p.—Union Carbide Development Co., NYC. **(217)**

MOTOR COUPLINGS. Provides units' data, including information on new corrosive duty cover with exceptional resistance to acids. 6p.—Link-Belt Co., Chicago. **(218)**

SILICONES. Illustrates and describes silicone fluids, protective coatings, electrical insulation, and rubber with application data for each. 8p.—General Electric, Waterford, N. Y. **(219)**

PYREX DRAINLINE. Contains product and property data and lists advantages of corrosion resistant glass system for disposal of chemical wastes. 16p.—Corning Glass Works, Corning, N. Y. **(220)**

BALL VALVES. Provides comprehensive information on manually operated and pneumatically operated units in sizes from ¼" thru 12". 31p.—Hills-McCanna Co., Carpentersville, Ill. **(221)**

INDIRECT FIRED HEATERS. Shows how unit maintains low metal wall temps so that no refractories are required in heating of gases, vapors, and light and heavy liquids. 8p.—Brown Fintube Co., Elyria, O. **(222)**

PLASTIC PIPING EQUIPMENT. Includes chemical resistance and physical properties charts with application recommendations for various types. 15p.—Chemtrol, Santa Ana, Calif. **(223)**

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. . . simply circle key item number (found at the end of each item) on handy Inquiry Card—back of book. Then print your name and address, and mail.

PROCESSING

VIBRATING FEEDERS. Illustrates typical applications of firm's varied sizes and capacities of air-powered units.—Cleveland Vibrator Co., Cleveland. **(226)**

PULVOCRON. Details an advanced impact and air attrition pulverizer combined with internal particle size classifier.—Strong Scott Mfg. Co., Minneapolis. **(227)**

BLENDERS. Describes four-way blending action for production of highly intimate blends in 1 to 2 minutes.—Sturtevant Mill Co., Boston. **(228)**

SEPARATORS. Introduces revolutionary unit for faster and more accurate material processing with better sanitation, more flexibility, and reduced maintenance costs. 20p.—Southwestern Engineering Co., Los Angeles. **(229)**

COOKER/MIXER. Illustrates and describes unit that cooks as it mixes and speeds up cooking time in one efficient operation.—Groen Mfg. Co., Elk Grove Village, Ill. **(230)**

DAIRY EQUIPMENT. Covers complete line of separators, clarifiers, butter machines, etc., with details on construction features and photos of each. 24p.—Centrico Inc., Englewood, N. J. **(231)**

SCREENERS. Details new sanitary unit with unique construction and mechanical features to meet specific material and capacity requirements. 4p.—Orville Simpson Co., Cincinnati, O. **(232)**

GAS SPARGING. Details a new method of treating foods and beverages to insure retention of important consumer acceptance qualities. 4p.—Air Reduction Co., NYC. **(233)**

MAGNETIC TRAP. Provides information on new unit designed to separate tramp iron and iron of abrasion from products conveyed through pipe lines. 2p.—Dings Magnetic Separator Co., Milwaukee, Wis. **(234)**

EGG HANDLING SYSTEM. Introduces new system that brings drastic reductions in labor and substantial savings in overhead and quality control heretofore commercially impossible. 16p.—Food Machinery & Chemical Corp., Riverside, Calif. **(235)**

PACKAGING

BACON WRAPPING. Introduces a new system offering automatic carton loading, labor saving operation, reduced spoilage, ease of operation, and quick changeover.—St. Regis Paper Co., NYC. **(239)**

PACKAGING SPECIALTIES. Collapsible tubes, plastic closures, and custom molded specialties are described with specs and illustrations.—Wheeling Stamping Co., Wheeling, W. Va. **(240)**

CARTON SELECTOR. Details a new and unique automatic unit with modular and expandable design for sorting and/or counting of packaged products.—Atronic Products Inc., Bala-Cynwyd, Pa. **(241)**

TRAYMAKER. Introduces unique tray-type carton set-up machine that saves labor, reduces carton costs, and saves warehouse space. 4p.—Memco Machinery Corp., Charlotte, N. C. **(242)**

RESYN COATING. Introduces unique copolymer that resists mineral acids, alkalies, aliphatic and aromatic esters, alcohols, and ketones. Sample included with bulletin. 12p.—National Starch & Chemical Corp., NYC. **(244)**

CLEAR PLASTIC DOMES. Illustrates and describes stock size units for use with foods, candy, and bakery products in round, square, rectangular, and pyramid shapes. 1p.—Hopple Plastics Inc., Cincinnati. **(245)**

PACKAGE CASING EQUIPMENT. Pictures and specs on all basic equipment—set-up machines, loaders, and sealers—are included with floor plan drawings to illustrate infeed and delivery alternatives. 8p.—Food Machinery & Chemical Corp., Philadelphia. **(248)**

SANITATION & MAINTENANCE

FLOOR SURFACER. "Penntrowel," a wear resistant, resinous, epoxy, thermosetting protective coating for concrete floors is fully explained and illustrated.—Pennsalt Chemicals Corp., Natrona, Pa. **(251)**

SAFETY GLAZING. Details laminated architectural glass for glazing hazardous industrial areas to help eliminate casualties caused by flying glass. 4p.—Monsanto Chemical Co., Springfield, Mass. **(252)**

STEEL STORAGE EQUIPMENT. Provides a time-saving reference tool to help storage system planners quickly pinpoint their main storage objectives and the best ways to achieve them. 15p.—Alan Wood Steel Co., Oaks, Pa. **(253)**

CONCRETE FLOOR MAINTENANCE. Explains methods of concrete floor maintenance with step-by-step procedures for curing, sealing, and continued maintenance of old and new floors. 8p.—Puritan Chemical Co., Atlanta, Ga. **(254)**

SYNTHETIC RUBBER COMPOUND. Introduces a one part formulation, factory mixed, and ready for immediate on the job use for sealing, caulking, or glazing. 15p. —David E. Long Corp., Jamaica, N. Y. **(255)**

IONAC WATER TREATMENT. Includes in easily-read chart form a list of 23 common troubles arising from water and fuel contaminants and other causes, and recommends one or more treatments for each. 4p.—Ionac Chemical Co., Birmingham, N. J. **(256)**

STEEL CONTAINER LININGS. Test chart manual is designed to help steel container users. Manufacturers, and reconditioners select proper protective linings by telling "which lining holds what for how long." 49p. —Bradley & Vrooman Co., Chicago. **(257)**

INGREDIENTS

MUSHROOM CONCENTRATE. Descriptive sheet details a new mushroom flavoring specialty composed completely of natural materials. 2p.—Fritzsche Bros., Inc., NYC. **(261)**

LEMON JUICE. Report shows how this ingredient can enhance food's natural flavor, preserve its freshness, and add to its nutritional value. 13p.—Sunkist Growers, Ontario, Calif. **(262)**

CORN SWEETENERS. Shows how corn syrup and solids can produce frozen desserts with substantially better body, texture, and resistance to heat shock. 24p.— American Maize-Products Co., NYC. **(263)**

INGREDIENT PRICE LIST. Contains short descriptions and uses of essential oils, aromatic chemicals & specialties, and certified colors, including prices for each. 36p.— Dodge & Olcott Inc., NYC. **(264)**

POLYPROPYLENE FILM. New packaging film, "Olefane," is detailed with characteristics, applications, list of properties and product samples.—Avisun Corp., Philadelphia. **(246)**

BLISTER PACKAGING FACTS. Provides a compilation and condensation of information about blister packaging and thermoforming. 24p.—Jackmeyer Corp., NYC. **(247)**

MATERIALS HANDLING

OVERHEAD CONVEYOR SYSTEMS. Gives comprehensive design, application, and maintenance data for systems geared to any requirement. 24p.—Hapman Corp., Kalamazoo, Mich. **(266)**

PALLET LOADING MACHINE. Introduces a new unit with greater capacity, more flexibility, and simplified hydraulic system to handle heaviest loads without stalling.—Alvey Conveyor Mfg. Co., St. Louis, Mo. **(267)**

TRUCK LEASING. New report, "How to Get Out of the Truck Business," shows how firm's truck leasing plan frees your management, releases your capital, and takes over maintenance problems. 8p.—Hertz Truck Lease, NYC. **(268)**

(Turn page)

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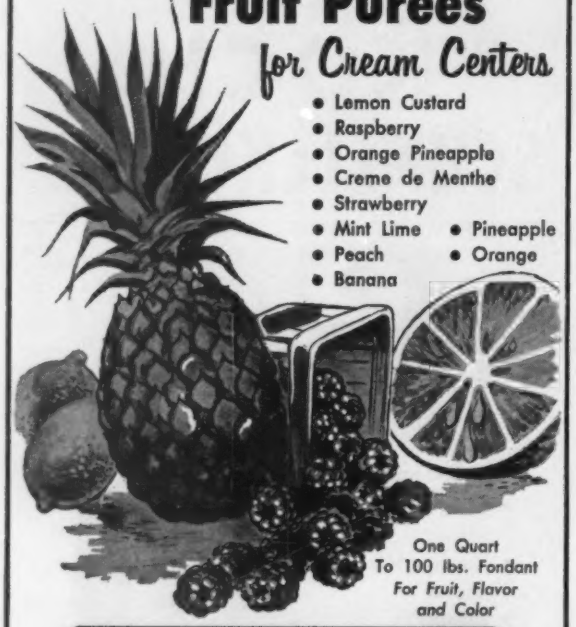

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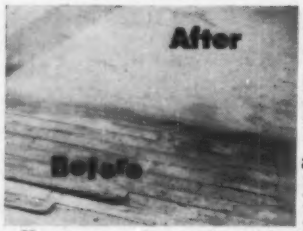

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Just Off The Press (continued)

MECHANICAL PALLETIZING. Case history outlines advantages of automatic bag and bale handling system and graphically illustrates its operation in large food processing operation. 10p.—Lamson Corp., Syracuse, N. Y. **(269)**

LIFT TRUCKS. New line is fully illustrated and described, emphasizing greater stability through low center of gravity, faster travel and lift speeds, one man adjustable fork spacing, and all-weather pneumatic tires. 12p.—Hyster Co., Portland, Ore. **(270)**

PNEUMATIC CONVEYING SYSTEMS. Details all standardized components, capacities, horsepower requirements, and selection data on four separate systems designed to meet 75-80% of all air conveying needs. 8p.—Sprout, Waldron & Co., Muncy, Pa. **(271)**

INSTRUMENTS

MOISTURE METER. Introduces a portable lab unit that continuously monitors water vapor in gas, designed for many control applications. 6p.—Beckman Instruments Inc., Fullerton, Calif. **(276)**

TEMPERATURE TRANSMITTER. Outlines features and specs of new pneumatic unit which uses filled thermal system and transmits standard 3-15 psi signal, varying in proportion to changes in temp measure. 8p.—Minneapolis-Honeywell, Philadelphia. **(277)**

COMPUTERS. Illustrated brochure details latest advances in computer technology and equipment, including a report on revolutionary new type unit. 18p.—Computer Systems Inc., Monmouth Junction, N. J. **(278)**

VISUAL WEIGHT INDICATORS. Features equipment showing weights on easy to read direct reading dials for use where printed weights are not required. 4p.—Streeter-Amet Co., Grayslake, Ill. **(279)**

MARKETING

CONSUMER ANALYSIS. Gives comprehensive data on brand preferences among 63 food and beverage items in Greater Milwaukee area for '60 and '61. 146p.—Milwaukee Journal, Milwaukee, Wis. **(291)**

PROFITABLE PROMOTIONS. Outlines 18 basic pointers on planning, timing, and following through on successful consumer promotions. 9p.—A. C. Nielson Co., Chicago. **(292)**

MARKETING CHECK-LIST. Lists 99 questions enabling you to evaluate various aspects of your marketing program, including distribution, field sales, costs, pricing, advertising, etc. 14p.—Stewart, Dougall & Assoc., NYC. **(293)**

MARKET STATISTICS. Handy booklet lists population and retail sales of 199 top markets in the U. S. plus rate of growth since '50. Includes color-coded map showing locations, and ranks states according to population and rate of change. 18p.—J. Walter Thompson Co., NYC. **(294)**

MANAGEMENT

SUCCESSFUL SUPERVISION. Shows how to translate management plans and objectives into realistic accomplishments through intelligent handling of people and problems with maximum results. 4p.—Elliottt Service Co. Inc., Mount Vernon, N. Y. **(301)**

INDUSTRIAL RESEARCH. Presents New York State's many advantages for the location of scientific research facilities and as a residence for research personnel. 25p.—New York State Dept. of Commerce, NYC. **(302)**

EMPLOYEE ATTITUDES. Colorful poster, one of a series in a weekly educational poster program, encourages employes to speak well of their company at all times. —Kelly-Read & Co. Inc., Rochester, N. Y. **(303)**

MANAGEMENT PLANNING. Provides complete information for planning the sound growth of a small firm. Includes checklist for a quick picture of where you stand as a planner. 4p.—Small Business Administration, Washington, D. C. **(304)**

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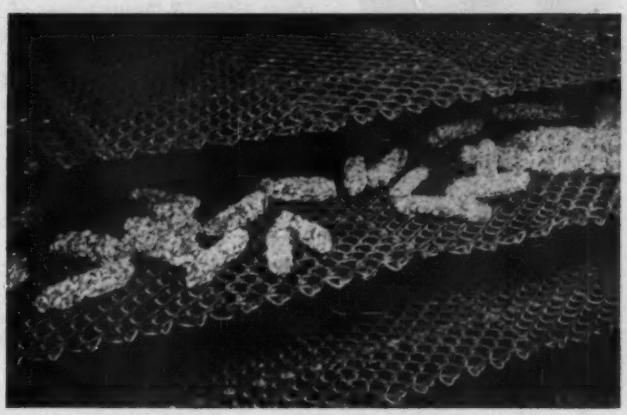

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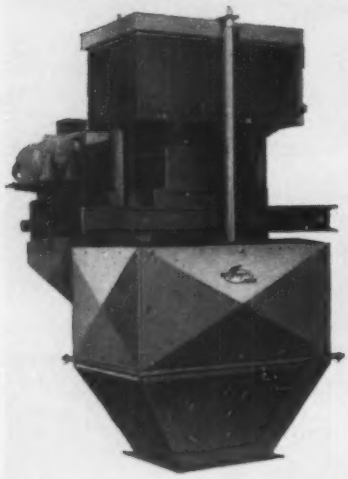

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BUSINESS MANAGEMENT HANDBOOK *by J. K. Lasser. McGraw-Hill Book Co., Inc., 330 W. 42nd Street, NYC 36. 1961. 842p. Price: $12.50.*

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Food Flavorings

FOOD FLAVORINGS: COMPOSITION, MANUFACTURE, AND USE *by Joseph Merory, The AVI Publishing Co., Inc., Box 388, Westport, Conn. 1960. 381p. Price: $12.50.*

Written by a practicing flavor manufacturer, this book is the first of its kind. It is based on forty years of close contact with manufacturers who make or use food flavors, purchasers who order them, and chemists who utilize flavorings in food products. From inquiries into their needs and requirements, as well as from information concerning their ingredients and manufacturing procedures, practical solutions to flavoring problems have been made possible and are published in this book.

Volume is divided into three parts: Natural Food Flavorings; Imitation Flavors, and Uses of Food Flavorings.

Marketing Angles

MARKETING: A MATURING DISCIPLINE *ed by Martin L. Bell. American Marketing Assn., 27 East Monroe Street, Chicago 3. 1961. 487p. Price: $4.00 (members); $6.00 (non-members).*

This new book views marketing from five important angles. The areas are: Theory, Management, Research, Education, and Morality. It contains the text of sixty-three speeches delivered by marketing authorities before the Winter Conference of American Marketing Assn. held in St. Louis last year.

Other subjects included are: Retail Competition; New Mathematical Tools for Management; Corporate Responsibility in Marketing; Industrial Marketing; Advertising; Wholesaling; International Marketing; Agricultural Marketing; and Distribution Costs.

Vending Statistics

DIRECTORY OF AUTOMATIC MERCHANDISING. *National Automatic Merchandising Assn., 7 South Dearborn Street, Chicago, Ill. 1960. 264p. Price: $4.50.*

Contains all the facts, figures, and trends about the fast-growing automatic vending industry. Lists vending machine manufacturing companies, vendible product suppliers, manufacturers of component parts and services, and operating company members of N.A.M.A. Each listing includes comprehensive information about the types of products manufactured and supplied and gives the names of key company executives.

Booklets & Reports

CALIFORNIA ASPARAGUS: EFFECT OF TRANSIT ENVIRONMENTS *(Report No. 428). USDA, Agricultural Marketing Service, Washington, D. C. 26p.* Presents studies conducted to determine adequacy of refrigeration of heavy loads in both conventional and new types of railway cars to take advantage of reduced costs.

HEALTH SAFETY OF PLASTICS PACKAGING MATERIALS AND THEIR RELATION TO THE FOOD ADDITIVES AMENDMENT OF 1958. *Plastics Dept., Dow Chemical Co., Midland, Mich. 12p.* Summarizes the Amendment and its relation to plastics as food packaging materials and how they can be used with complete safety and public confidence.

Recent Inventions

PRODUCTS

Milk Powder Comprising Spray Dried Homogenized Blend of Winterized Liquid Butter Fat with Aqueous Dispersion of Non-Fat Milk Solids. — A. W. Williams, The Borden Co., N. Y. C. No. 2,966,409.

Shortening Comprising Edible Liquid Oil, Surface Active Agent, Polyoxalkylene and Ester-Ethers. — C. J. Houser, National Dairy Products Corp., N.Y.C. No. 2,968,562.

Chocolate Chiffon Containing Cocoa Powder, Partially Degraded Soy Protein, Phosphated Gelatin and Sugar. — W. A. Mitchell, General Foods Corp., White Plains, N. Y. No. 2,968,565.

Chicken Concentrate Made by Contacting Boned-In Chicken With Phosphoric Acid and Then Neutralizing Acid After Meat and Bones Are Disintegrated.—M. M. Scharf, Louis Milani Foods, Inc., Los Angeles. No. 2,968,569.

Yeast-Free Prepared Flour Mix for Making Yeast-Free Bakery Products. — S. Z. Matz, USDA. No. 2,969,289.

Self-Gelatinizing Starch-Bearing Grains Free of Malt Contaminants for Brewing Fermented Beverages.—A. J. Nugey, Rahway, N. J. No. 2,970,054.

Improved Edible Shortening Prepared by Molecularly Rearranging Triglyceride Fat Substantially Free of Mono- and Diglycerides in Presence of Interesterification Catalyst.—J. J. Gleason, The Rath Packing Co., Waterloo, Ia. No. 2,970,055.

Spray-Dried Protein-Emulsifier Powder.—M. Loewenstein, Crest Foods Co., Inc., Ashton, Ill. No. 2,970,913.

Whipped Margarine Comprising 15-40% Inert Gas to Produce 90 to 105F. Melting and 71 to 82F. Setting Points Product. — D. Melnick, Corn Products Co., N.Y.C. No. 2,970,917.

Topping and Confectionery Product Produced by Combining Frozen Creaming Base Dispersion With Powdered Sugar.—O. Petersen, Hayward, Calif. No. 2,970,918.

EQUIPMENT

Dough Divider and Topping Machine.—M. C. Brudi, Fort Wayne, Ind. No. 2,963,995.

Nut Coating Machine in Which a Strand of Pliable Candy Is Extruded Upward Through a Pool of Nut Particles.—C. E. Cloud, Wilmette, Ill. No. 2,967,493.

Conveyorized Unit for Heat Treatment of Products in Sealed Containers.—P. Carvallo, Paris, France. No. 2,968,232.

Revolving Drum-Type Poultry Plucking Machine.—R. S. Zebarth, Gordon Johnson Co., Kansas City, Mo. No. 2,968,831.

Pastry Dough Folding Machine for Making Fruit-Filled Danish Pastry. — L. Schafer, N. Y. C. No. 2,969,025.

Candy Extruder Comprising Opposed Rolls Spaced To Provide Guide Channel Between Them and With One Roll Having Slot Through Which Expeller Blade Slides. — W. H. Genich, J. W. Greer Co., Wilmington, Mass. No. 2,969,026.

Apparatus for Measuring and Segregating Sliced Products from Slicing Machines. — H. K. Gillman, Cashing, Inc., Rochester, N. Y. No. 2,969,099.

Machine for Receiving Eggs and Delivering Them to Conveyor System. — H. L. Mumma, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,969,136.

PROCESSING

Sorting Moldy Raisins From Sound Ones by Optical Difference. — F. S. Nury, USDA. No. 2,967,614.

Conveying Comminuted Food Substances at Controlled Rate for Continuous Injection With High-Velocity Cooking Steam.—J. B. Anderson, H. J. Heinz Co., Pittsburgh. No. 2,967,773.

Producing a Juice Concentrate by Subjecting Beverage Liquid to Freezing Temperatures in Closed Recirculating System and Centrifuge-Separating Out Ice Crystals.—S. P. Cole, Institutum Divi Thomae Foundation, Cincinnati. No. 2,967,778.

Maintaining Fresh Qualities of Stem-End Peaches by Immersing Them in Chilled Water.—C. Pruess, Clovis, Calif. No. 2,968,568.

Easy Sliceable Debonned Hams Produced by Water Soaking, Cutting Out Bones, Inserting in Stockinettes and Smoking.—J. G. Pinta, Reliable Packing Co., Chicago. No. 2,968,570.

Making Frozen Dessert Mix by Evaporating Milk, Adding Sugar and Butterfat to Evaporated Milk and Then Running Mix Through Heat-Exchanger, Homogenizer and Cooler. — D. B. MacCallum, Dewitt, N. Y. No. 2,969,287.

Salting Split Pistachio Nuts by Centrifuging with Salt Solution.—F. Bloch, USDA. No. 2,969,290.

Producing Crystalline Spray Dried Material by Adding Seed Material to Fluid Material During Spray Drying.—J. P. Terrett, Dairy Foods, Inc., Los Angeles. No. 2,970,057.

Preparing Powdered Fruit Juice by Mixing Juice or Pulp With Xylitol, Evaporating and Introducing Dried Mix Into Fluid-Tight Container.—L. Nobile, Milan, Italy. No. 2,970,058.

Vacuum Freezing Dressed Poultry.—W. L. Morrison, Liquefreeze Co., Inc., N. Y. C. No. 2,964,412.

PACKAGING

Cleaning Machine for Open-Mouthed Containers With Means for Moving Spaced Air Pressure Nozzles in and out of Gripped, Spaced and Conveyed Containers. — J. P. Whelan, Pneumatic Scale Corp., Ltd., Quincy, Mass. No. 2,967,321.

Machine for Loading Knife-Cut Fatty Meat Strips Into Containers. — R. L. Hill, Morgan Packing Co., Austin, Ind. No. 2,967,386.

Pouch-Packaging Cheese in CO_2 Atmosphere to Inhibit Mold and Bacteria Growth. —P. E. Grindrod, Portage, Wis. No. 2,967,777.

Infusion Bag for Producing a Coffee Beverage by Passing Hot Water.—N. Goros, Sealpak Corp., Bronx, N. Y. No. 2,968,560.

Edible Container Comprising the Forming Batter of Unbaked Ingredients in a Heat-Pressure Mold.—C. H. Birnkrant, Birnkrant Frozen Confection Co., Los Angeles. No. 2,968,561.

Method of Handling Supply of Similar Containers for Packaging in Complements of Predetermined Multiples. —R. J. Hickin, Packaging Corp. of America. No. 2,968,898.

Sampling Device for Bag Filling Unit.—B. W. Rose, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,968,948.

Perforated Pouch-Package Adaptable for Cooking in Hot Liquid.—M. T. Heller, Milprint, Inc., Milwaukee. No. 2,969,292.

System for Boxing Rolls Consisting of Carton Conveyor, Roll Baking Pan Supporting Rack and Means for Loading Rolls Into Cartons and Removing Empty Pans From Racks. — I. M. Archer, Campbell-Taggart Associated Bakeries, Inc., Dallas, Tex. No. 2,969,633.

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In the case of Manischewitz, the proven Triangle Elec-Tri-Pak automatic weighing system was combined with other well-established methods of packaging. Triangle Production Engineering detailed the combination so it would fit directly into Manischewitz operations. As a result, the machine was simple and efficient. Crackers went into cartons gently, and fast enough to help make Manischewitz an effective competitor.

The sensitivity of the five Elec-Tri-Paks and their new auxiliary, double-stage vibratory feed system gives Manischewitz unusual accuracy as well as speed. Yet the entire automatic weighing installation is simple and dependable—no complicated adjustments . . . just as easy to maintain as it is to clean.

Like so many other users of Triangle machines, Manischewitz already knows what we want to show you. Why not write or call for our free brochure, "A Story About People, Packaging and Profit." Request also our folder on Triangle automatic weighing. Both tell why you can depend on Triangle.

F-15-AL

The B. Manischewitz Co., Newark, New Jersey, has used Triangle Elec-Tri-Paks for fully automatic weighing for years. Now, they have installed this new, fully automatic Triangle weighing and packaging system to put crackers into cartons.

38 YEARS

. . . . . YOU REALLY SAVE WITH . . . . . .

TRIANGLE
PACKAGE MACHINERY COMPANY

6637 W. Diversey • Chicago 35, Illinois
Telephone TUxedo 9-0200

FOOD
ENGINEERING

READER INQUIRY SERVICE

FREE . . . to you! Cost-cutting, profit-making information.

Facts about equipment, ingredients, packages, supplies and services described or advertised in this issue are easily available to you through this section.

Numbers on back of each tear-out post card correspond to the key numbers on equipment, package, ingredient, sanitation, supply, or service items, and to advertisements.

It's easy. All you do is . . .

Select . . . items that interest you as you read this issue. All items are conveniently named in two lists on the following three pages. First list is alphabetically arranged by name of manufacturer or supplier. Second is alphabetical by product or service category.

Then . . .

Circle . . . number of each item you want on the back of one of the post cards.

Write . . . your name, title, company, and address in space provided on card.

Check . . . **"IMPORTANT MUST INFORMATION"** on card.

Mail . . . No postage necessary if mailed in U.S.

Use of inquiry cards restricted to those with buying authority or responsibility in food manufacturing.

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

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PERMIT NO. 23708
PHILA. 39, PA.

BUSINESS REPLY MAIL
No Postage Stamp Necessary if Mailed in U. S.

POSTAGE WILL BE PAID BY
FOOD Engineering

The Computer Center
P.O. Box 7572, Philadelphia 4, Pa.

Advertisers' Alphabetical Listing

Circle corresponding numbers at left on Inquiry Card

111 **American Steel & Wire.** Cyclone conveyor belts, booklet.

58 **American Sterilizer.** Freeze drying equipment, Bulletin c-606.

106 **Aseptic-Thermo Indicator.** Retort tags, test supply.

22 **Avco.** Freezing units.

94 **F. L. Burt.** Piston filler, bulletin 106.

78 **Clinton Corn Processing.** Corn syrup.

85 **Day.** Dust control, information.

56 **Distillation Products.** Monoglycerides, samples.

64 **Dodge Manufacturing.** Screw conveyor drives, technical data.

55 **Dragoco.** Spectroscopy as quality control, booklet.

95 **DuPont deNemours.** Dry acid cleaner base, booklet.

53 **Firmenich.** Powdered flavors, technical information.

6 **Food Machinery & Chemical.** Fillers, bulletin 501E.

57 **General Electric.** Starter enclosures, Bulletin GEA-7324, Section 813-38.

10 **B. F. Goodrich Industrial Products.** Materials handling hose.

32 **Hercules Powder,** Beef flavoring, applications.

50 **Hubinger.** Starches & syrups.

126 **A. E. Illes.** Fruit purees.

124 **International Flavors & Fragrances.** Flavors.

100 **Johns-Manville.** Celite filtration, details.

109 **Koch Supplies.** Mixer, applications.

49 **Ladish. Valves.**

86 **LaPorte Mat & Manufacturing.** Steel conveyor belts, literature.

2 **Mack Trucks.** Trucks.

90 **Merck Chemical.** Ascorbic acid.

4 **Merck Chemical.** MSG.

88 **Minneapolis-Honeywell.** Instruments.

110 **Monroe.** Floor toppings, details.

23 **Morton Salt.** Flavorings in tablet form, information.

125 **Niagara Blower.** Refrigeration, bulletin 105.

123 **Norda.** Vanilla flavoring.

9 **Oakite Products.** Cleaning techniques, bulletin.

8 **Olin Mathieson.** Cartons.

62 **Orr & Sembower.** Boilers and burners, bulletin 1260.

87 **Owens-Illinois.** Corrugated boxes.

92 **Pfaudler Permutit.** Fillers, reprint 540.

82 **Phillips Chemical.** Tote boxes, trays.

105 **Pneumatic Scale.** Filler, powder.

75 **Pulverizing Machinery.** Pulverizing machinery.

107 **Resina Automatic Machinery.** Screw capper, literature, specifications.

27 **Riegel Paper.** Cartons.

76 **Rohm & Haas.** Enzymes, information, sample.

26 **C. G. Sargent's Sons.** Dryers, details.

30 **Sharples.** Filtration of cold oil.

44 **Speas.** Apple pectins, information.

99 **Straham Valves.** Valves, catalogue.

103 **Sunkist Growers.** Exchange low methoxyl pectin, data.

17 **Taylor Instrument.** Panel instruments.

112 **Thayer Scale.** Scales.

15 **Thermovac.** Evaporators.

118 **Triangle Package Machinery.** Packaging machinery.

14 **Urschel Laboratories.** Knives.

60 **Vilter Manufacturing.** Refrigeration systems, bulletins.

89 **Warner-Jenkinson Manufacturing.** Certified food colors.

5 **Werner Machinery.** Baking equipment.

80 **West Carrollton Parchment.** Treated papers.

61 **Wright Machinery.** Packaging machinery, information.

18 **York.** Compressors.

Product or Service Category Listing

Air Conditioning & Refrigeration

416 **Air conditioner.** King Co. of Owatonna.

18 **Compressors.** York.

215 **Doors, cold storage.** Jamison Cold Storage Door.

22 **Freezing units.** Avco.

125 **Refrigeration.** Niagara Blower.

60 **Refrigeration system.** Vilter Mfg.

Cleaning & Sanitation

414 **Beacon, revolving.** Trippe Mfg.

95 **Cleaner base, dry acid.** Du Pont de Nemours.

452 **Cleaning solution strength monitor.** Redford.

9 **Cleaning techniques.** Oakite Products.

255 **Compound, synthetic rubber.** David W. Long.

85 **Dust control.** Day.

469 **Lactic culture media.** Klenzade Products.

454 **Odor control.** Chemical Insecticide.

Name .....**Title** .....

Company .....

Address .....

City .....**Zone** .....**State** .....

Do you wish to receive FOOD Engineering? YES ☐ NO ☐

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Where ads offer more than one item, I've written key number and identity below

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JUNE 1961

Expires August 31, 1961

IMPORTANT MUST INFORMATION

Please check in A & B below best description

A—Your Function

- ☐ 1. Administrative
- ☐ 2. Plant Operating
- ☐ 3. Tech.-Engineering
- ☐ 4. Other

B—Principal Product

- ☐ 1. Bakery Products
- ☐ 2. Beverages
- ☐ 3. Confectionery
- ☐ 4. Fruits & Vegetables
- ☐ 5. Grain Products
- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods
- ☐ 10. Multi-Foods (2 or More)

←CHECK ***Important Must Information***

WRITE—*name, title, company and address*

CIRCLE—*number of items you want*

MAIL

Construction & Fabrication

251 Floor surfacer. Pennsalt Chemicals.
110 Floor topping. The Monroe Co.
410 Insulation, plastic foam. Dow Chemical.
455 Insulation, thermal. Reeves Bros.
201 Lining, teflon. Raybestos-Manhattan.
451 Tile, acoustical. Armstrong Cork.

Disintegration Equipment

14 Knives. Urschel Labs.
75 Pulverizing machinery. Pulverizing Machinery.
227 Pulvocron. Strong Scott.

Electrical Equipment

57 Starter enclosures. General Electric.

Equipment & Truck Leasing

268 Truck leasing. Hertz Truck Lease.

Ingredients & Additives

90 Ascorbic acid. Merck & Co.
468 Colloid, vegetable, Burtonite.
89 Colors, food. Warner-Jenkinson.
263 Corn sweeteners. American Maize-Products.
78 Corn syrup, starch. Clinton Corn Processing.
470 Emulsifier, sponge cake. R. T. Vanderbilt.
76 Enzymes. Rohm & Haas.
467 Enzymes. Western Biochemical.
32 Flavoring, beef. Hercules Powder.
123 Flavoring, vanilla. Norda.
23 Flavorings in tablet form. Morton Salt.
124 Flavors. International Flavors & Fragrances.
53 Flavors, powdered. Firmenich.
126 Fruit purees. A. E. Illes.
264 Ingredient. Dodge & Olcott.
262 Lemon juice. Sunkist Growers.
56 Monoglycerides. Distillation Products Industries.
4 MSG. Merck Chemical.
261 Mushroom concentrate. Fritzsche Brothers.
103 Pectin, exchange low methoxyl. Sunkist Growers.
44 Pectins, apple. Speas.
219 Silicones. General Electric.
466 Starch. National Starch & Chemical.
50 Starches & syrups. Hubinger.

Instruments, Measurement & Control

278 Computers, Computer Systems.
417 Detector. Advanced Instruments.
411 Flowmeter. Co-Engineering.
418 Flowmeter, magnetic. Foxboro.
88 Instruments. Minneapolis-Honeywell.
17 Instruments, panel. Taylor Instrument.
276 Meter, moisture. Beckman Scientific & Process Instruments.
402 Pneumatic probe, vacuum-powered. Cargill.
419 Recorder, antegrating. Fisher Scientific.
112 Scales. Thayer Scale.
55 Spectroscopy. Dragoco.
413 Switch, liquid level. Liquidometer.
277 Temperature transmitter. Minneapolis-Honeywell.
279 Weight indicators. Streeter-Amet.

Management Services

291 Consumer analysis. Milwaukee Journal.
303 Employee attitudes. Kelly-Read.
304 Management planning. Small Business Administration.
294 Market. J. Walter Thompson.
293 Profitable marketing. Stewart, Dougall & Associates.
292 Promotions, consumer. A. C. Nielsen.
302 Research, industrial. New York State Dept. of Commerce.
301 Supervision, successful. Elliott Service.

Materials Handling

404 Carton selector system. Atronics Products.
271 Conveying systems, pneumatic. Sprout, Waldron & Co.
111 Conveyor belts, cyclone. American Steel & Wire.
86 Conveyor belts, steel. La Porte Mat & Mfg.
64 Conveyor drive, screw. Dodge Mfg.
203 Conveyor, magnetic. Eriez Mfg.
266 Conveyor systems, overhead. Hapman.
218 Couplings, motor. Link-Belt.
235 Egg handling system. Food Machinery & Chem.
226 Feeders, vibrating. Cleveland Vibrator.
270 Lift trucks. Hyster.
10 Materials handling hose. B. F. Goodrich.
267 Pallet loading machine. Alvey Conveyor Mfg.
269 Palletizing, mechanical. Lamson.
82 Tote boxes, trays, flats. Phillips Chemical Co.
208 Vibrator. Sprout, Waldron & Co.

Mixing Equipment

228 Blenders. Sturtevant Mill.
230 Cooker, mixer. Groen Manufacturing.
406 Feeder, recording. Wallace & Tiernan.
109 Mixer. Koch Supplies.
214 Mixing units. Straham Valves.

Moisture Removal

26 Dryers. C. G. Sargent's Sons.
15 Evaporators. Thermovac.

JUNE 1961

Expires August 31, 1961

CHECK→ Important Must Information

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- ☐ 9. All Other Foods
- ☐ 10. Multi-Foods (2 or More)

MAIL

Name .....Title .....

Company .....

Address .....

City .....Zone .....State .....

Do you wish to receive FOOD Engineering? YES ☐ NO ☐

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Where ads offer more than one item, I've written key number and identity below

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58 **Freeze drying equipment.**
American Sterilizer.

Packaging Equipment

405 **Bagger, automatic.** Thayer Scale.
107 **Capper, screw.**
Resina Automatic Machinery.
241 **Carton selector.**
Atronic Products.
409 **Caser.**
Food Machinery & Chemical.
415 **Cleaner, jar.**
Standard Metal Products.
401 **Coder.** Nalbach Engineering.
412 **Coupon-placing unit.**
Thiele Packaging Machinery.
6 **Fillers.**
Food Machinery & Chemical.
92 **Fillers.** Pfaudler Permutit.
94 **Fillers, piston.** F. L. Burt.
105 **Fillers, powder.** Pneumatic Scale.
207 **Overwrapping machine.**
Halm Instrument.
408 **Packer, multi.** Continental Can.
248 **Package casing equipment.**
Food Machinery & Chemical.
118 **Packaging machinery.**
Triangle Package Machinery.
61 **Packaging machinery.**
Wright Machinery.
403 **Sorting machine.**
Illumitronic Systems.
242 **Traymaker.** Memco Machinery.

Packaging Materials

322 **Adhesive for aluminum foil.**
Rubba.
311 **Aluminum can, pull-tab.**
Central States Can.
87 **Boxes, corrugated.**
Owens-Illinois.
312 **Cartons.**
Container Corp. of America.
8 **Cartons.** Olin Mathieson.
27 **Cartons.** Riegel Paper.
316 **Cartons, sulphate board.**
International Paper.
318 **Cellophanes, high yield.**
American Viscose.
245 **Domes, clear plastic.**
Hopple Plastics.
313 **Labels, end.** Crown Zellerbach.
317 **Lithography, fine screen.**
Lord Baltimore Press.
240 **Packaging.** Wheeling Stamping.
247 **Packaging, blister,** Jackmeyer.
80 **Papers, treated.**
West Carrollton Parchment.
314 **Plastic clip.** John L. Rie.
315 **Plastic package for self mix.**
William Steven.
213 **Plastic shapes.** Garlock.
321 **Plastics, styrene-based.**
Monsanto Chemical.
319 **Polyethylene resin.** Koppers.
246 **Polypropylene film.** AviSun.
244 **Resin coating.**
National Starch & Chemical.
239 **Wrapping, bacon.**
St. Regis Paper.

Pipes, Valves, Tubing

220 **Drainline.**
Corning Glass Works.
212 **Pipe fittings, steam traps.**
Sarco.
223 **Piping equipment.** Chemtrol.
49 **Valves.** Ladish.
99 **Valves.** Strahman Valves.
221 **Valves, ball.** Hills-McCanna.
216 **Valves, semi-steel.**
Rockwell Manufacturing.

Plant Services

254 **Floor maintenance, concrete.**
Puritan Chemical.
233 **Gas sparging.** Air Reduction.
252 **Glazing, safety.**
Monsanto Chemical.
453 **Gloves for work.** Pioneer Rubber.
253 **Storage equipment, steel.**
Alan Wood Steel.
256 **Water treatment.** Ionac Chemical.

Power and Steam Generating Equipment

62 **Boilers and burners.**
Orr & Sembower.

Processing Equipment (Heat)

5 **Baking equipment.**
Werner Machinery.
222 **Heaters, indirect fired.**
Brown Fintube.
106 **Tags, retort.**
Aseptic-Thermo Indicator.

Pumps

407 **Pump, all-plastic.**
Planet Products.
211 **Pumps, stainless steel.**
Creamery Package Manufacturing.

Separation Equipment (Dry)

217 **Filter, air.**
Union Carbide Development.
232 **Screeners.** Orville Simpson.
234 **Trap, magnetic.**
Dings Magnetic Separator.

Separation Equipment (Wet)

231 **Dairy processing equipment.**
Centrico.
202 **Filter.** Swimquip.
100 **Filtration, celite.**
Johns-Manville.
30 **Filtration, cold oil.** Sharples.
229 **Separators.**
Southwestern Engineering.

Shipping Containers

257 **Linings, steel container.**
Bradley & Vrooman.
206 **Shipping cases.** Owens-Illinois.

Transportation

2 **Trucks.** Mack Trucks.

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

FIRST CLASS
PERMIT NO. 23708
PHILA. 39, PA.

BUSINESS REPLY MAIL
No Postage Stamp Necessary if Mailed in U. S.

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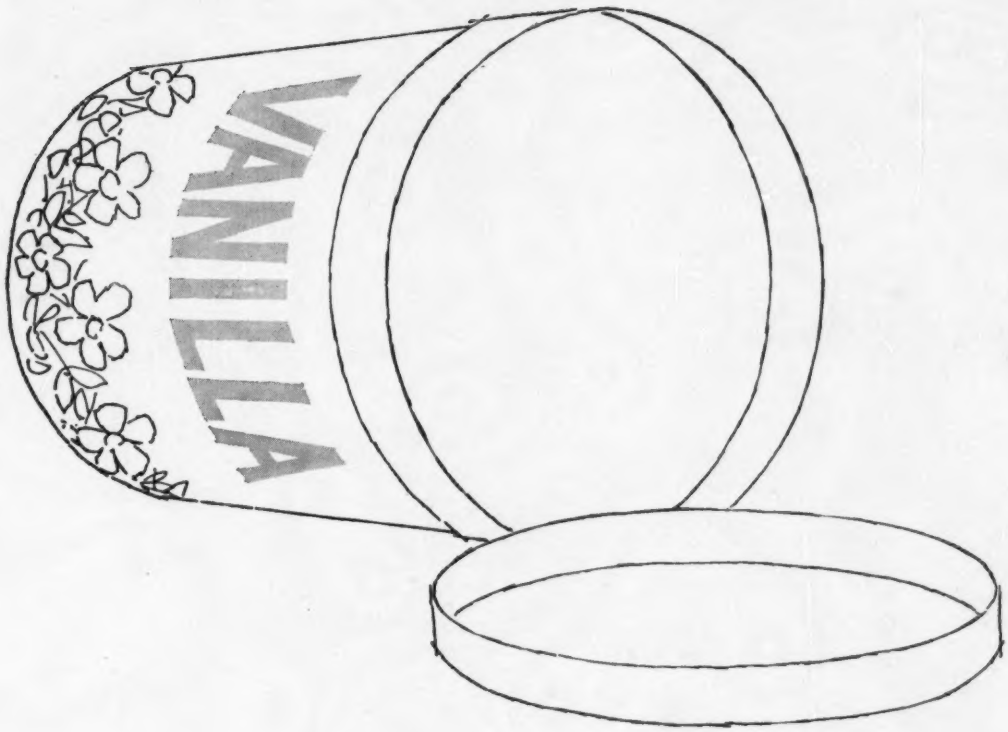

When all is said and done...

...NOTHING

TASTES SO TRUE

TO NATURE

Norda®

Flavor it with a favorite

Exclusive Basic Materials for: Candy and Chewing Gum, Dairy Products (Ice Cream and Cheese), Soft Drinks, Desserts (Puddings and Gelatins), Meat Products, Syrups, Bakery Products (Cake Mixes, Crackers, Snack Items), Pharmaceutical Products, Liquors and Cordials.

Write on your letterhead for free samples.

NORDA, 601 W. 26 St., New York 1, N.Y. • Chicago • Los Angeles • San Francisco • Toronto • Montreal • Havana • London • Paris • Grasse • Mexico City

CIRCLE 123 ON INQUIRY CARD

CIRCLE 124 ON INQUIRY CARD →

WHICH FLAVORS WILL OUTSELL?

Identical flavors to the eye, yes . . . to the taste, no. The basic difference in each case is the unique flavor of one—perfected to outsell—developed by IFF.

Creating outstanding flavors for individual products is an experienced specialty of IFF. The result is a product which establishes brand demand, repeat sales, in a highly competitive market.

And if you are in the international market, IFF can minimize problems of supply. Uniform manufacturing and quality control in all of its plants throughout the world assure customers that IFF flavors, wherever ordered, remain the same from batch to batch.

For the flavors that outsell, contact IFF.

iff

FLAVOR DIVISION

INTERNATIONAL FLAVORS & FRAGRANCES INC.

417 Rosehill Place, Elizabeth 2, N. J.

Leading Creators and Manufacturers in the World of Flavor

ARGENTINA AUSTRIA BELGIUM BRAZIL CANADA ENGLAND FRANCE GERMANY HOLLAND INDONESIA ITALY NORWAY SOUTH AFRICA SWEDEN SWITZERLAND U.S.A.